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New Researches
ON THE
CHEMOTHERAPY OF SYPHILIS.

Being an Address delivered to the Section of Dermatology of the Royal Society of Medicine on Jan. 21st

BY C. LEVADITI,
OF THE INSTITUT PASTEUR, PARIS.

IN the Harben lectures, delivered in December, 1923, and subsequently published in the *Journal of State Medicine*, I discussed the therapeutic action of bismuth in syphilis, and that of arsenic administered per os in the form of stovarsol. My later investigations into the action of stovarsol in yaws, amœbiasis, spirillary infections, and malaria will be found in a paper in THE LANCET of Sept. 19th, 1925, p. 593.

In this lecture I shall, therefore, confine myself to a detailed review of the latest investigations into these matters.

1. MODE OF ACTION AND OF ABSORPTION OF BISMUTH IN THE TREATMENT OF SYPHILIS.

In a previous paper Messrs. Levaditi, Nicolau, and Mlles. Salgue and Schoen[1] demonstrated that for the destruction of the treponema in the chancre of rabbits treated with basic tartro-bismuthate (trépol) very minute quantities of bismuth are required, so small, in fact, that it was impossible to detect them by the usual methods of titration. Since then, however, Mr. Girard has devised a quantitative method by which 1 "microgramme" (1/1000th of a milligramme) may be estimated in the tissues or body fluids. The following facts relating to the mechanism of the destruction of the spirochæta in the specific lesions have been obtained by this method.

EXP. 1.—Rabbit 81B. Weight = 2250 g. Showed two large syphilitic chancres of the scrotum (Truffi's virus); it was given 0·1 g. of trépol per kg. of weight (intramuscularly). On the fourth day all treponemata had disappeared and the lesions were smaller. The animal was killed.

EXP. 2.—Rabbit 91B. Weight = 2850 g. Two large chancres of the scrotum. Same treatment, similar results. The animal was killed on the sixth day.

The injected muscles, several organs, and the chancres were examined histologically as well as chemically.

Histological Examination. — The histo-chemical method[1] shows the presence of bismuth almost exclusively in the injected muscle. In the muscle the diapedetic process is intense, and reaction phenomena are evident (giant cells, fibroblasts). No lesions of the organs.

Quantitative Analysis.

Rabbit.	Bi content in a gramme of dried substance.						
	Bi (in microgrammes).						Bi (in milligrammes).
	Lung.	Spleen.	Liver.	R. testis.	L. testis.	Kidney.	Injected muscle.
	µ mg.	µ mg.	µ mg.	µ mg.	µ mg.	µ mg.	mg.
81B (killed on fourth day)	30	48	4	—	3	44	17·5
91B (killed on sixth day)	16	6	2	2	2	24	8·0

[1] Levaditi, Nicolau, Mlles. Salgue and Schoen: Comptes rendus Académie des Sciences, 1924, clxxix., 939.

Quantitative Analysis (continued).

—	Bi in the chancre.			
	Rabbit 81B—		Rabbit 91B—	
	in 1 g. of dried substance.	in the whole chancre.	in 1 g. of dried substance.	in the whole chancre.
	µ mg.	µ mg.	µ mg.	µ mg.
Right chancre ..	4·5	2	5·8	2
Left chancre ..	10·0	2	4·3	±1

These results prove (1) that the Bi content of the organs is higher in the rabbit killed on the fourth day than in that killed on the sixth day; (2) that the kidney, lung, and spleen show the largest amounts of Bi; (3) that the lesions contain infinitesimal quantities of Bi. Thus, the destruction of the treponema in the chancres requires amounts of Bi varying between 1 and 2 µ mg. for the whole lesions—that is, between 4 and 10 µ mg. for 1 g. of dried substance. These amounts are hardly larger than those for unreactive tissues, like the liver or testis. From this it follows that the *lysis of the spirochætes occurs under the action of infinitesimal quantities of Bi, no accumulation of the metal taking place in the actual situation where this lysis is brought about.* The destruction of the parasite by Bi appears then as a lytic process, in which mere traces of the metal seem to act as a catalytic agent towards the spirochæticide principles supplied at a given time by the infected organ. As a matter of fact, it is well known that the specific lesions become at length cicatrised, the treponemata preserving their vitality as long as the lesion exists. On the other hand, minute quantities of Hg, As, Bi, and even vanadium, quicken considerably this slow lysis of the parasites. The analogy with certain enzyme processes, which are much accelerated by certain metallic catalysts, becomes thus strikingly obvious.

Histo-chemical Study of the Mode of Absorption of the Bismuth Compounds.

After the discovery by Sazerac and Levaditi of the curative action of bismuth in syphilis, it became necessary for the study of its absorption to work out an histo-chemical method for the detection of the metal in the tissues. We have been able to devise such a method, which was reported in the paper already referred to.[1] Our results were as follows:—

Technique of the Histo-chemical Method (derived from the analytical method of Leger-Aubry).

Fix with Dubosq-Brasil-Bouin's fluid for 4–5 days. Wash with ordinary water for six hours. Then place the pieces of tissue in the following mixture: potassium iodide, 4 per cent., quinine sulphate, 2 per cent., equal parts, for 6–8 hours at 37° C. Wash with distilled water, alcohol, xylol, and imbed in paraffin. The sections, after removing the paraffin and staining, are immersed in the following mixture: potassium iodide, 2 per cent., quinine sulphate, 2 per cent., equal parts, for two hours at 37° C. The sections are then mounted with or without a counter-stain.[2]

Delicacy of the Method.—Applied to the examination of muscles of rabbits injected with solutions of K and Na tartro-bismuthate, varying from 0·01 g. to 0·0001 g., it has proved to be sensitive up to this latter degree (1/10,000), both the tissue in paraffin and the 10 µ section being obviously stained in red. The amount of Bi contained in one single section (5–6 µ) of the injected muscle has been estimated by Mr. Girard to be about 20 microgrammes.

Experiment.—Four bismuth compounds have been used: insoluble basic tartro-bismuthate; metallic bismuth in a fine suspension; soluble K and Na tartro-bismuthate; and the proteo-metallic bismuth compound named bismoxyl.[3] We have thus studied

[2] As a counter-stain, we prefer the Curtis method.

[3] Levaditi and Nicolau: Annals Inst. Pasteur, 1924, xxxviii., 179.

the mode of absorption of Bi in all the forms used. The injection was made into the back muscles of infected rabbits showing chancres of the scrotum or into healthy animals. The rabbits were killed from the first day to the thirtieth, and the injected muscle and several organs (liver, kidney, spleen, brain, &c.) were examined for bismuth. Moreover, in the case of several animals, chemical analyses were carried out by Mr. Girard.

Our conclusions were the following:—

1. The bismuth compound given by the intramuscular route is absorbed according to its solubility. Whereas the insoluble derivatives remain for a long time in the injected muscle, the absorption taking place slowly and gradually, the soluble compounds, on the other hand, are quickly assimilated, and leave only a very slight residuum. The sudden and massive elimination of these soluble derivatives may bring about in the kidney certain lesions which are not to be found in the animals treated with insoluble bismuth salts, even when the latter were administered in a higher dose.

2. The insoluble bismuth salts, as well as metallic bismuth itself, are not absorbed unless previously rendered soluble within the tissues. The local process of leucocyte proteolysis seems to bring about this solution. The derivatives, thus made soluble, attach themselves to the tissue protein substances and give rise to some proteo-bismuth compounds where the metal is hidden. It is in this form that it travels throughout the body and is eliminated through the kidney. This is demonstrated by the fact that it is impossible to detect the presence of bismuth in the organs (kidney, spleen, and brain) by the histo-chemical method, whereas the analytical process (after a previous destruction of all organic matter) reveals a relatively enormous amount of the metal.

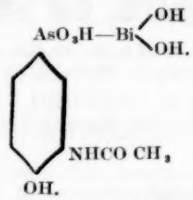
3. The administration of bismuth into the muscle occasions diapedesis, and degenerative and regenerative phenomena, which are more evident with insoluble compounds than with soluble salts or proteo-metallic derivatives. Bismoxyl seems to be, among the latter, that which causes the least local alteration.

4. The part played by phagocytosis in the absorption of bismuth, as we pointed out in 1922,[4] seems more slender than might be supposed at first.[5] The white blood cells, the fixed cells, and the endothelial cells, in fact, the reticulo-endothelial system, act as phagocytes towards the bismuth particles.[6] It does not however, appear that these phagocytic cells allow the bismuth to travel throughout the body. On the contrary, everything seems in favour of the idea that the phagocytes, by fixing the metal, help in the formation of a bismuth "depôt," to which must be ascribed the success of this lasting and efficient therapy of syphilis.

5. This depôt is much greater in the case of insoluble bismuth salts. The muscles retain these salts during several months, supplying the body with relatively minute quantities of an organo-metallic salt, containing hidden bismuth, which are sufficient for the destruction of the treponemata.[7]

2. RESULTS OBTAINED WITH BASIC ACETYLOXY-AMINOPHENYL ARSINATE OF BISMUTH.

We shall now report our investigations concerning a new compound containing both bismuth and arsenic—namely, basic acetyloxyaminophenyl arsinate of bismuth. When, under certain conditions, the sodium salt of acetyloxyaminophenyl arsinic acid (stovarsol, As content 27 per cent.) and sodium potassium bismuth-tartrate (Bi, 30 per cent.) are brought together, both in concentrated aqueous solution, a white precipitate appears. This precipitate, after several washings, when dried at 56° C., appears as a yellowish-white powder, insoluble in water, but soluble in caustic bases. Chemical analysis proves this substance to be a new compound with the following formula:—



Bi content, 41 per cent. (40·2).
As content, 15 per cent. (14·5).

We have had the action of this compound under investigation since October, 1924. Our results are as follows:—

Experimental Syphilis.—The salt has been used as a flocculent suspension either in saline or in oil (10 per cent.). The injection was made into the muscle.

(*a*) Suspension in saline: Bi = 0·0125 g. per c.cm. As = 0·00457 g. per c.cm.

Rabbit 50: Severe lesions, showing numerous treponemata. Weight, 3330 g. Received 1·0 c.cm. per kg.—that is, 0·0125 g. Bi and 0·0045 g. As. Oct. 12th, 1924: Complete healing after four days. No loss of weight. No relapse.

Rabbit 51B: Severe lesions, numerous parasites. Weight, 2700 g. Received 0·5 c.cm. per kg.—that is, 0·0062 g. Bi and 0·00225 g. As. Oct. 23rd, 1924: Complete healing after five days. No relapse.

Rabbit 12D: Severe lesions, numerous treponemata. Weight, 2900 g. Received 0·1 c.cm. per kg.—that is, 0·00125 g. Bi and 0·00045 g. As. Oct. 23rd, 1924: Complete healing after five days. No relapse.

Given in a dose of 0·05 g. per kg. the compound showed no effect. It follows that the *bismuth-arsenic derivative administered as a flocculent suspension in saline proves to be efficient in the cure of experimental syphilis with a dose of 1·5 mg. Bi per kg.* The ratio of the curative to the toxic dose C/T exceeds 1/10 (estimated as Bi).

(*b*) Oil suspension: (10 per cent.: 0·041 g. Bi and 0·015 g. As per c.cm.).

Rabbit 76D: Chancres of the scrotum with numerous parasites. Weight, 2600 g. Received 1·0 c.cm. per kg. (0·041 g. Bi and 0·015 g. As) on Jan. 12th, 1925. The lesions quickly healed.

Rabbit 804A: Severe lesions, many parasites. Weight, 1850 g. Received the same dose (0·041 g. Bi and 0·015 g. As per kg.). Complete healing without relapse after five days.

These findings prove that the arsenic-bismuth compound in an oil suspension exhibits a curative action in experimental syphilis in a dose of 0·041 g. Bi per kg. Our experiments in the mouse nagana and fowl spirillosis demonstrated that the new derivative is also efficient as a preventive and curative agent in the case of these infections (the preventive dose for the fowl corresponds to 0·0036 Bi per kg.).

These results induced us to try the new product in the treatment of human syphilis. The findings of Messrs. Fournier and Schwartz brought full confirmation of our own results. These authors have treated 20 syphilitic patients with chancres or secondary lesions. In spite of the small number of patients and of the short period of time since the beginning of the treatment they are firmly convinced of the high therapeutic value of the product. Nineteen patients received 12 intramuscular injections of 2 c.cm. each of a 10 per cent. oil suspension—i.e., 0·984 g. Bi and 0·36 g. As). A single patient was given two series of ten injections with a month's interval between. The injections were given twice a week. The drug was perfectly tolerated, there was no painful local reaction, and no general reaction. One patient, however,

[4] Levaditi: La Presse Médicale, No. 59, July 26th, 1922.
[5] Sazerac and Vaurs: Annales Pasteur, 1925, xxxix., 86.
[6] Levaditi, Nicolau, Mlles. Salgue and Schoen: Loc. cit.
[7] Levaditi and Girard: C.R. Acad. des. Sciences, 1925, clxxx., 420.

showed, after 12 injections, a mild erythema of the arsenic-erythema type. There was no albuminuria and no irritation of the gums. The general condition always remained perfect with no weariness and no loss of weight, as may be observed in the use of a number of bismuth compounds. Probably this favourable characteristic is due to the presence of arsenic, which renders the drug specially useful for patients in poor condition.

The treponemata disappeared 24 to 48 hours after the first injection; with two patients the sterilisation of the lesions followed the second injection. The cicatrisation was effected very rapidly, as with any of the best bismuth preparations. The drug had a similar action on all general manifestations when they were present. Fourteen patients, who were kept under observation during subsequent months, did not show any relapse.

The effect on the blood reaction was quite obvious. With two patients who had a negative blood W.R. it constantly remained negative, but of 12 subjects with a positive blood W.R. 6 gave a negative result a few days after the beginning of the treatment; with 4 others the blood W.R. was considerably attenuated; and with the 2 last the reaction was not quite so favourably influenced.

From the above findings Messrs. Fournier and Schwartz drew the following conclusions:—

1. The basic acetyloxyaminophenyl arsinate of bismuth is perfectly tolerated and is not handicapped by the inconvenience met with in the use of the ordinary bismuth compounds.

2. The effect on the treponema and on the lesions appears as quickly as it does with the best antisyphilitic drugs. No relapses are observed.

3. The effect on the blood reactions is quite obvious. A negative test may be obtained after a single series of 12 injections.[8]

These facts have been fully confirmed by Messrs. Nicolau, Doskocil, and Galloway,[9] who have examined the action of the arseno-bismuth derivative in the experimental trypanosomiasis of the mouse and rabbit (nagana) and in fowl spirillosis. The compound has proved to have an evident spirillicide and trypanocide effect in vivo.

Lastly, further researches by Mr. Popoff [10] furnish another attestation of the above-reviewed facts. This investigation concluded that "the basic acetyloxyaminophenyl arsinite of bismuth has a high antisyphilitic power in the primary or secondary stages of the disease, and even in an old latent syphilis the treponemata disappear and the lesions become cicatrised, while the blood test becomes negative. The change in the blood reaction often takes place some time after the end of the treatment, which proves that the action of the drug is extended over a long period of time. From this point of view it behaves like the bismuth compounds which form a 'depôt' assuring the lasting and deep therapeutic effect of the metal."

3. THE ACTION OF GOLD AND PLATINUM AS SPIRILLICIDE AGENTS.

We have investigated the therapeutic power of *gold and sodium thiosulphate* in experimental syphilis of the rabbit. This salt, which has a gold content of 37·4 per cent., was introduced into the therapeutics of tuberculosis by Mollgaard; 0·05 g. per kg. seems to be the maximum tolerated dose when given intravenously. By the subcutaneous route the salt is well tolerated in doses varying from 0·01 g. to 0·03 g. per kg.; two rabbits received 0·05 g. per kg. One died on the fourth day, the other survived.

Therapeutic Action (Truffi's virus and *Sp. cuniculi*).

(*a*) *Intravenous Route.*—Evident curative effect with a dose of 0·05 g. per kg. (0·018 g. pure gold). Spirochætes disappeared on the second day.

(*b*) *Subcutaneous Route.*—The smallest curative dose is 0·02 g. (0·0074 g. Au) per kg. (No more spirochætes on the second day; cicatrisation of the lesions on the fourth day; no relapse.) The therapeutic power, although inconstant, was still apparent in a dose of 0·01 g. (0·0037 g. Au) per kg.

(*c*) *Buccal Route.*—Contrary to all expectation, the gold compound, administered by the mouth, brings about the sterilisation of the lesions after two days, and their cicatrisation after 3–5 days, in a dose of 0·20 to 0·50 g. per kg. Given in this way, therefore, gold is absorbed by the digestive mucous membrane.

These findings demonstrate that the gold and sodium hyposulphite has a curative action on the experimental syphilis of the rabbit (Truffi's virus) and on the disease due to *Spirochæta cuniculi*. The ratio C/T, as found by the subcutaneous route, stands around $\frac{1}{4}$. The compound is efficient when given by the mouth. Further tests have proved that it exerts a real prophylactic action in fowl spirillosis at a dose of 0·01 g. to 0·02 g. per kg.

The results obtained with gold suggested to us the idea of experimenting with platinum in the form of platinum and sodium thiosulphate. This salt has been given by subcutaneous injection in a dose of 0·015 g. to 0·03 g. platinum per kg. to several rabbits infected with *Sp. cuniculi*. In one of these animals the lesions were rapidly cicatrised and the parasites disappeared; two others did not show complete healing, and the lesions were but partially sterilised.

It follows, therefore, that gold, and to a lesser extent platinum, is endowed with spirillicide and treponemicide properties in vivo. These properties are far less marked than those of bismuth. There seems to be a correlation between the atomic weight of these metals and the therapeutic action; bismuth (A. wt. = 208) is more active than gold (197·2), which is itself more efficient than platinum (195·2). The form in which gold is given, too, seems to be of great importance. As a matter of fact, the doses being equal or even higher, the potassium and gold chloride and colloidal gold prepared by Mr. Fourneau are totally inactive. We may presume that other metals belonging to the same group (Os, Ir, Ru, Rh, Pd) would have similar properties. Their study is being undertaken.

Such striking results warranted a careful examination of the therapeutic action of gold in human syphilis. The tests have been carried out by Messrs. Fournier and Mollaret.[11] Their conclusions were as follows.

The sodium and gold thiosulphate has an indisputable and rather powerful antisyphilitic action when used in large doses (around 1 g.) by intramuscular or intravenous injection. Under those conditions treatment is attended by the disappearance of the treponemata, the rapid cicatrisation of the lesions, and a favourable change in the blood reactions. With small doses the effect is much slower and questionable. The use of this compound is attended by serious inconvenience such as general reactions, cutaneous manifestations, and even the production of albuminuria which constitutes a real drawback to its constant use in the cure of human syphilis; at least, under the form we described.

We must remember, however, that Bruck and Glück,[12] as well as Mario Truffi,[13] had already called attention to the curative properties of potassium and gold cyanide and of gold chloride in human and experimental syphilis.

[8] L. Fournier and A. Schwartz: C.R. Académie des Sciences, June 22nd, 1925, clxxx., 1973.
[9] Nicolau, Doskocil, and Galloway: C. R. Soc. Biologie, July 25th, 1925, xciii., 580.
[10] L. Popoff: Ibid., July 25th, 1925, xciii., 577.
[11] L. Fournier and P. Mollaret: C.R. Acad. des Sciences, Dec. 7th, 1925, clxxxi., 943.
[12] Bruck and Glück: Münch. med. Wochenschr., 1913, No. 2, p. 57.
[13] Mario Truffi: Pathologica, 1913, t. v., p. 397.

A DIRECTORY entitled "Annuaire Médical de Grèce" containing information on medical facilities and the names of doctors, chemists, midwives, and others in Greece is published in French and Greek by Assael and Mazza, Boîte Postale 18, Athens, at 10s.

REMARKS ON MANIPULATIVE TREATMENT.

Being the Two Opening Papers read at a Discussion at the Medical Society of London on Jan. 25th, 1926.

I.—BY W. ROWLEY BRISTOW, M.B. LOND., F.R.C.S. ENG.,
ORTHOPÆDIC SURGEON TO ST. THOMAS'S HOSPITAL.

II.—BY R. C. ELMSLIE, M.S. LOND., F.R.C.S. ENG.,
ORTHOPÆDIC SURGEON TO ST. BARTHOLOMEW'S HOSPITAL.

I.—By W. Rowley Bristow.

MANIPULATIVE surgery or manipulative treatment should lend itself well to discussion if only for the reason that every year or two brings forth a heated controversy on the subject in either the medical or the lay press, or both. The same well-worn arguments crop up, and, in the lay press at least, a list of distinguished and titled personages who have benefited generally follows, together with letters of gratitude. That this gratitude is given to those who practise bonesetting and are unqualified has led the public to believe that this form of treatment is not included in the armamentarium of the qualified surgeon or practitioner. In these articles, too, all the patients are grateful; failure is relatively unknown, and it is only the doctor who has blundered.

What are the true facts? It is a platitude that adequate treatment necessitates an accurate diagnosis. Diagnosis depends upon an understanding of the anatomy and the pathology of the part affected. Now, is it true that those unqualified practitioners, who have not had the advantage of a general medical education, whose fundamental grounding is necessarily at fault, succeed and the qualified man fails?

The Errors of Ignorance.

I suppose that all of us can recount instances when the patient has failed to benefit in the hands of the unqualified practitioner, and has responded readily and well to orthodox treatment.

In February, 1919, I was consulted by a patient, S., complaining of trouble with the knee. He had had trouble with the other knee and had consulted a bonesetter who had arranged to manipulate. With the patient's consent, I wrote to the bonesetter and told him that I should be glad to witness his manipulation. I wanted to see whether the method used differed in any way from that which I employed. I received a letter saying that the bonesetter regretted that he could not allow me to be present, but that he hoped I would particularly watch the outcome, as this was the type of injury in which "he was pretty uniformly successful." The symptoms were those of recurrent dislocation of the semilunar cartilage, which in my experience was not likely to be cured by manipulation. The patient was not benefited, and a little later I removed the torn cartilage, since when he has had no further symptoms.

Rarely, but very rarely, does manipulation cure a true cartilage lesion—that is, one in which the cartilage is torn and is at times displaced across the joint. Sometimes it may be possible by great force to rupture the so-called bucket handle and allow the torn meniscus to roll up into the inter-condyloid notch; but with the history of repeated recurrence open operation is the safer and more certain procedure. It was interesting to find that in spite of repeated invitations—as I understood them—in the public press the unqualified practitioner was not prepared to allow an orthopædic surgeon to witness his manœuvres.

In April, 1922, a professional footballer, G., was brought to me with a similar history. The same bonesetter had manipulated the knee, and told him he could carry on and play football. At the first attempt the symptoms recurred, and shortly afterwards I removed a torn cartilage from the joint.

In my own practice a similar sequence of events occurs fairly frequently. There is no object in multiplying examples. A less common type of error is when the unqualified practitioner has had a true dislocation to deal with, when a bone has really been out of place, and he has failed to recognise the fact. A child was admitted under my care at St. Thomas's, who had been under a bonesetter for either three or six months, because she walked badly. The manipulative treatment of the spine to which she had been subjected had been ineffectual, because the child was suffering from congenital dislocation of the hip, calling for manipulative reduction. This is an instance of what is perhaps the greatest danger of unqualified practice—namely, the inability to make a correct diagnosis in a simple case.

Within the last week I saw a lady who teaches folk-dancing, and who was suffering from footstrain from overuse. On visiting the bonesetter, she was told that ankles, knees, hips, and spine were all "out," and that two weeks' treatment in his home was essential. She became suspicious and refused treatment, because a certain cure was offered by the same man for her husband who had suffered with osteo-arthritis for many years and was a complete cripple. Moreover, the cure was offered as certain and rapid—it was to take only a week—on her mentioning the fact of her husband's disability. There was apparently no necessity for any preliminary examination.

Another patient, with stiffness of the spine and swelling of the ankles, had spent some weeks and much money on treatment by an osteopath. He was no better. The symptoms were due to a focus of infection, gonococcal in origin, in the prostatic urethra. His symptoms are clearing up under appropriate treatment.

Confidence and the Mystic Rites.

These examples, and they are a few selected at random, are quoted to show that there is reason to believe that the failures of the unqualified are many. It is an unpleasant, although I deem it a necessary task to call attention to the fact. It is not a personal question. Any surgeon whose work and interest lay in bone and joint surgery would have done as I did. I do not wish to imply that we always succeed and that the bonesetter always fails. One man may fail with a patient when another, equally (but no better) armed, and with no greater experience, will succeed. The personal factor is of importance. Many men, with no very obvious qualification, succeed, while the more highly qualified may be failures. I do not mean in the financial sense, but in the sense of succeeding with and of benefiting their patient. Personality counts for much. Experience counts for much. A combination of the two, even when the basis of the work done is empirical, does produce good results. The bonesetter has many successes, but if empiricism rather than knowledge is the foundation on which he works unnecessary errors must creep in.

There is one way in which the unqualified practitioner sometimes scores, and that is because he takes a risk which we are not prepared to take. If we cannot be sure of the diagnosis we must play for safety.

I remember seeing a girl complaining of trouble in the lower part of her back, and I was not certain whether this was due to an inflammatory lesion or not. The X ray left me still in doubt. I saw her in consultation with another surgeon, of great experience, and we were unable to exclude the possibility of her symptoms being caused by disease. We therefore recommended fixation and rest. We heard afterwards that this patient was taken to a bonesetter, who manipulated the spine and cured her.

This is an example of what sometimes happens, and is, I think, bound to happen. That patient is probably going about saying that the profession failed her, and that she was cured by a bonesetter. It is our business to see that this occurs as seldom as may be.

From time to time, when manipulative surgery is discussed by members of the profession, it is hinted that there is something yet to learn—some manipulative art which has been handed down outside the ranks of the regular practitioner, and which he either will not or cannot acquire. The matter is really very simple, and Sir Robert Jones, in his Cavendish lecture, puts it clearly. He says:—

"Let me emphasise the statement that there is nothing which the manipulator does which cannot be more safely undertaken by any practitioner, who possesses a knowledge of the pathology and elementary anatomy of the joint, but he must become familiar with methods of manipulation

which are safe and thorough. . . . Let it be fully realised that there are no hidden or mystic rites in the art of bone-setting."

The group of surgeons who are specially interested in bone and joint surgery—and there are over 150 members in the British Orthopædic Association—practice manipulative treatment. I would hazard a guess that year in and year out, the number of patients so treated must run into thousands. This branch of therapeutics is by no means left only to the bonesetters, the osteopaths, and the chiropractors.

A little book entitled "The Medical Follies," written by Dr. Morris Fishbein, a member of the American Medical Association, and sometime editor of its Transactions, has been published recently. The author gives a history of the many forms of quackery and tells of the origin and growth of osteopathy and chiropractic. He summarises very neatly as follows:—

"It has been said that osteopathy is essentially a method of entering the practice of medicine by the back door. Chiropractic, by contrast, is an attempt to arrive through the cellar. The man who applies at the back door at least makes himself presentable. The one who comes through the cellar is besmirched with dust and grime; he carries a crowbar and he may wear a mask!"

No good purpose will be served in going over old history. We must bear in mind, however, that Wharton Hood in 1871 published a small book in which he dealt quite fully with the subject as appreciated at that time. This book was based on what he had learnt from Hutton, the best known unqualified exponent of manipulative treatment of his period. It is true to say that Wharton Hood's teaching was not well received; but the fact remains that the so-called secrets were laid bare, and the mystery was cleared up.

Neglect of Manipulation.

The methods of manipulative treatment were not absorbed into the general practice of medicine, because the teachers in the medical schools did not recognise their value. There were exceptions, but the statement is fundamentally true—and it is true to-day. The field for manipulative surgery lies largely in the treatment of minor injuries, and to a less extent of chronic joint disease. This is the type of condition which loses its perspective in hospital practice. The graver conditions are those which arrest the attention of the surgeon. Go to what hospital you will, or read the operation lists as posted in the Royal Society of Medicine—you find surgery on the grand scale. There would seem to be no room and no time for adequate attention to be given to those minor disorders, which cease to be minor as soon as the student leaves the hospital and goes out into practice. I do not wish to go outside the bounds of the subject and I do not wish on this occasion to be thought to hold any brief for specialism or segregation, but facts must be faced.

It is not likely that any man can teach and arouse the student's interest in a subject of which he himself has no first-hand knowledge, and the practice of which branch seldom comes his way. If you read in the lay press articles about bonesetters and their cures, you will often notice that the patient has seen previously one or more distinguished members of the profession. You and I know that the choice made was unwise; that the expert whom they consulted was one whose admittedly great ability lay in other fields of surgery. He was not a surgeon whose interest, and therefore of necessity whose experience, lay to any extent in bone and joint surgery.

My own opinion is that it would be wise for those who control medical education to examine their premises, and to consider whether in the huge curriculum which now obtains, sufficient time and care is given to the instruction of the student in these minor ailments which form so large a part of practice. The first point which I venture to suggest as worthy of discussion is that the examining bodies and school councils should have their attention called to this subject of manipulative treatment, and that its principles and practice should be brought more prominently before the student.

For the purpose of this discussion I have left out of consideration the accepted use of manipulative treatment in the correction and cure of deformity, as no good purpose would be served by a discussion from this point of view. For example, manipulation is generally used in the correction of congenital dislocation of the hip, of traumatic dislocations, and for the reposition of fractures. When we consider some of the conditions which are benefited, and inquire into the actual way in which they benefit—what change manipulation brings about—they fall roughly into two main groups. These are the conditions resulting from injury, and those resulting from disease.

Conditions Resulting from Injury.

1. The so-called *internal derangement of joints*, most often met with in the knee, but also occurring in the wrist and the jaw. These joints have one feature in common; they contain an intra-articular fibro-cartilage, and it is sometimes in connexion with an injury to or displacement of this structure that the manipulation does good.

2. *Fibrosis of or about the Capsule: Adhesions.*—The differential diagnosis between this condition and arthritis of the joint must be borne in mind. With arthritis there is restriction of movement in all directions; with adhesions, limitation is noticed in certain movements only. The shoulder-joint provides a common example. Generally, flexion and adduction are free, whilst rotation and abduction are limited. The ankle-joint provides a second example, and the adhesions are commonly limited to the anterior fasciculus of the external lateral ligament. It is in connexion with the results of injuries to the knee-joint that manipulative treatment is perhaps most often discussed.

It has already been suggested that manipulation is sometimes called for because of an injury to the semilunar cartilage, but this is more often necessary when dealing with injuries to the other structures of the joint. Twists and strains of the knee, whilst they may injure the cartilage, more frequently damage the ligaments, and particularly the coronary ligaments. It seems likely that rupture of a few fibres of these ligaments, followed by hæmorrhage and organisation of the clot, brings about adhesions, with the matting together of structures, which account for the symptoms.

The diagnosis of cartilage injury is too often made when there is no real ground for it. In the latter part of the war, practically all the patients with knee-joint injuries were sent to the military orthopædic hospitals labelled as displaced semilunar cartilage. This is not the place or the time to discuss the differential diagnosis, but it is a fact that in the majority the cartilage was intact, and the knee was crippled from the result of injury with adhesions. Many of these patients were rapidly cured by manipulation. It is particularly with this joint that want of accuracy in diagnosis has enlarged the field for the bonesetter.

3. *Fibrosis of Muscle.*—The result of strain or injury is commonly met with in the back, particularly about the lower part of the erector spinæ. Lower backache is common. A voluminous literature has grown up around the lumbo-sacral and sacro-iliac joints. In the United States, if one may judge from the papers published in the journals, it is even more common. Now what are the remedies ordinarily taught to the student? It will depend a little whether the patient, he or she, reaches the medical, surgical, or gynæcological departments from the hospital sorting room. Routine examination reveals no abnormality, and X ray shows a normal spine and normal sacro-iliac joints. A thorough examination may reveal some pain or some restriction of movement on hyperextension or lateral bending of the spine.

Medicines, massage, liniments, electrical treatment, radiant heat, hot air, and the like remedies are tried. Sometimes they succeed, often they fail.

The bonesetter would generally cure such a patient. He would empirically employ forcible manipulation. I agree that the pathology in this instance is not certain, but it seems likely that adhesions have formed in some part of the muscle, or at its attachment to bone or fascia, as the result of injury or infection. Forced manipulation of the spine and pelvis will oftentimes result in complete cure. It is regrettable that such treatment is withheld until the patient has left her doctor or the hospital, and gone as a last resort to an osteopath.

Conditions Resulting from Disease.

It is difficult, if not impossible, to lay down rules or to define exact indications for the use of manipulative treatment in dealing with chronic joint disease. Why, on one occasion, do we treat a stiff shoulder with rest, warmth, and the like, and on another advise forcible manipulation. We rely upon the accuracy of our diagnosis, on our estimation of the pathological state of the joint at the moment. If there is active inflammation, manipulation will lead to disaster; but we shall on occasion employ it with success, if the acute stage is passed, and there be limitation of movement.

Different joints behave differently. Mr. Elmslie is dealing with the subject regionally, and I am leaving the detail to him; but as an instance of what I mean I would recall to you the difficulty of treating stiffness of the fingers and of the metacarpo-phalangeal range. Forced manipulation may be called for, but if it is, then the newly acquired position should be maintained by fixation for a time. Forced manipulation followed by free use results in greater stiffness. On the other hand, we can sometimes restore a useful degree of abduction to a hip-joint, when this movement has been lost as the result of osteo-arthritis, and follow up our manipulation by active exercises.

In addition to appreciating the pathological state of the particular joint, we must form an accurate estimate of the personality of the patient. This is important. Will he be willing to put up with the necessary pain, which the conserving of this newly acquired range will entail? Will he follow the treatment through? It is in dealing with joint disease that we are often called upon to repeat the forced manipulation, perhaps two or three times; at each attempt an added range is gained. The joint will respond to this manœuvre, whilst it would stiffen if we attempted to gain the full range at one sitting. There are other points worthy of discussion—What is the best means of conserving the range of movement gained by forced manipulation? What is the after-treatment? Shall we employ massage, electricity, and exercises, or shall we for a time fix, in our new position, on a splint?

Manipulative treatment is known to us as a profession, but in the multitude of complex disorders, and in the wealth of methods, this simple, homely remedy has been pushed into the background. It is our duty to see that the student of to-day is trained in its use, and that its advantages and limitations are brought before him.

II.—By R. C. ELMSLIE.

Manipulative methods, as carried out by unqualified practitioners who are variously classed as bonesetters, osteopaths, chiropractors, and otherwise, may be roughly divided into: 1. Manipulations of the affected part—e.g., for adhesions in or around such joints as the shoulder and knee. 2. Manipulations of some other part which is not obviously affected—e.g., manipulation of the spine as carried out by osteopaths. I will take this second group first, because it can be dismissed more easily. In most cases the whole procedure is so obviously irrational that it is difficult to understand how the public are continually taken in by those who practise it. To manipulate a stiff or disabled knee is reasonable, to manipulate the cervical spine for goitre or for diphtheria, the dorsal spine for gastric ulcer, or any part of the spine for epilepsy, sounds so ridiculous that it is hardly necesssary to subject the method to argument or to imagine that these methods will ever be taken up by the medical profession.

The osteopaths have no hesitation in citing medical opinion as favouring their methods. Here, for example, is one quotation from Hilton: "The pain associated with diseased spine is found upon the skin supplied by the nerves which escape from the vertebral canal through the intervertebral foramina." Severe abdominal pain, increased in the erect posture, is traced to "disease with slight displacement between the sixth and seventh dorsal vertebræ." Hilton is obviously speaking of the referred pain of spinal caries, but these words are lifted out of their context by the osteopath, as if they proved that small displacements of the vertebræ can cause visceral disease. Head's areas of referred pain are also quoted by osteopaths as proof of their thesis.

It is perfectly true that massage with passive and active movements of joints and properly regulated exercises can have a considerable effect upon certain visceral diseases. This is largely a medical question, but the medical side of the work of the masseur has been rather neglected by the profession, and it will amply repay some young physician to take the matter up and see whether careful investigation will not prove that there is a greater use for this type of treatment.

The bonesetters who carry out treatment by manipulation of the actual part affected are in some cases, I believe, honest and straightforward. They use methods which are largely the result of actual practice, but which are often well designed, and in the hands of some of them show a certain knowledge of anatomy and pathology. At any rate, the users of these methods gain experience and profit by it; they avoid gross errors of diagnosis, and they meet with results which show a degree of success that we must consider as to some extent merited. Sometimes they make evident mis-statements, which may or may not be deliberate. Thus they will say that there is a bone out of place where there is no bone to be out of place. It is difficult to say whether these mis-statements are due to ignorance or are made deliberately in order to impress their patient.

Other practitioners have less honest methods; their mis-statements are undoubtedly deliberate and exaggerated. Certain bonesetters, if a patient comes with a disability of the ankle, inform him that his ankle, knee, and hip are all out and must be manipulated. Following such a statement rule-of-thumb manipulations are made, which are sometimes successful, but sometimes, particularly in the case of neurotic patients, have disastrous other results.

Thus, I have recently had to treat an hysterical girl, who, having an undoubted disability of the knee-joint, was taken to a bonsetter. The knee and hip were both described as being out, and were manipulated. The knee got right, but the hip then developed a new disability in the shape of a severe hysterical gait; the girl had discovered, as the result of the manipulation, that she had naturally a snapping hip, which now became a real disability. Fortunately, the condition was recent and the patient was readily put right by a simple explanation of the anatomy of snapping hip.

In another case the results were more serious. A small foot disability was treated by manipulation of the lumbar spine and pelvis. The foot got right, but a persistent obsession has arisen, the patient believing that the whole spine and pelvis have now been put out by the manipulator. No amount of persuasion can cure her, and the obsession has become so severe that she must now be classed as a case on the borderline of insanity.

Methods of the Unqualified.

In considering the methods of the unqualified manipulators, particularly whether anything can be learnt from them, we must investigate the following

points: 1. What are the conditions treated? 2. How do the manipulations cure them? 3. Why do we so constantly see reports of the successes of unqualified manipulators after surgeons have failed? 4. Why do we never see reports of the successes of surgeons?

Mr. Bristow has dealt generally with these questions, and I shall confine myself to a few special points. The reply to the fourth question is largely bound up in the fact that reputable members of the medical and surgical profession do not advertise in the lay papers. Some years ago I treated the stroke of one of the University boats a week before the race for a displaced semilunar cartilage with the knee completely locked in a flexed position. By manipulation under an anæsthetic the joint was put right so quickly that the boy was only out of his boat for 24 hours. The whole incident passed unnoticed, but it may safely be said that had the treatment been carried out by an unqualified bonesetter it would have occupied the central position in most of the papers of the day. Similarly, most of us have treated successfully prominent athletes and footballers, either by manipulation or by operation. In almost any big football match one or more of the players would be found to be minus a semilunar cartilage, which has been removed by some surgeon, leaving a knee strong enough to stand up to the most severe form of athletics. These facts never get publicity, and many people still think that an operation for the removal of a semilunar cartilage leaves a permanently damaged knee.

The third question is also largely one of publicity. It is an undoubted fact that only the successes of the unqualified bonesetter are recorded; their failures remain hidden. The patient often feels that he has been done and has been induced to waste money; but he says nothing of the incident to his friends and often conceals it later when he visits a surgeon. We all meet with these case of failure of the bonesetters; I could recount very many. In some cases there is more than a failure; the patient is made worse. The bonesetter is not necessarily greatly to be blamed. Surgery of all sorts is not an exact science; accurate diagnosis is difficult, and in cases treated by manipulation it is specially so, because we can often only guess at the exact lesion present. Most of us have made the mistake of diagnosing a joint which is suffering from the results of trauma as tuberculous, or a tuberculous joint as traumatic in origin. Moreover, the responsibility of the surgeon is greater than is that of the unqualified man. However experienced he is in manipulative methods he is perhaps rather less inclined to take a risk. Judgment is particularly difficult in treating stiff joints which have resulted from a non-tuberculous arthritis. We know that if the arthritis is still active manipulation will almost certainly be a mistake; whereas if it is quiet, manipulation will in certain cases improve movement and diminish pain, but it is difficult to decide the exact stage at which manipulation is advisable. Hence it arises that to attain a regular success in the use of manipulation a large and wide experience in the treatment of disabilities of the bones, joints, and muscles is required. This is to my mind a very strong argument in favour of specialism in surgery. I believe that it is only by giving up certain large sections of surgery—e.g., abdominal and thoracic operations—that a surgeon is able to devote enough time to the treatment of bone and joint conditions to gain a detailed experience in them and thus to be able to judge of the best methods of treatment.

It is quite untrue to say that manipulative methods are not used by the medical profession. I can claim that I personally have used them since I first took up my specialty, and in my school I have followed Paget, Marsh, and Walsham, whose names should be honoured in this branch of surgery. I included a lecture on manipulative methods in my first course of lectures in the medical school and have never ceased to teach upon the subject. The mistake is to think that a surgeon whose chief interest lies in abdominal work is experienced in the whole of surgery. A surgeon who practically never sees or treats a sprain is naturally inexperienced in dealing with the late disability which results from one. The surgical profession is just as capable of carrying out manipulative methods and just as successful as is the unqualified practitioner. I would venture to say that if a strict comparison could be made it would be found that the surgeon, because of his experience of other methods, is the more successful of the two.

Indications for Treatment.

Coming to details of treatment, time will only permit me to give a few examples. Simple traumatic adhesions around joints naturally come to one's mind first. The shoulder, in which rotation is most often restricted, the wrist (flexion), the knee (flexion), and the ankle (plantar flexion and inversion), serve as good examples. In all these the history of onset, the absence of evidence of active arthritis, a careful investigation of exactly which movement is restricted or painful, and an X ray examination are necessary preliminaries.

I have come more and more to the conclusion that careful X ray examination is essential before manipulation. I have had the misfortune to manipulate a tuberculous tarsus even after such an investigation had been declared negative, and I have narrowly escaped manipulating another case in which an X ray showed a very small tuberculous focus in the external malleolus. On the other hand, I have cured by manipulation a number of cases of disability of the ankle, which had been treated for as much as a year as being tuberculous. Ossification in the muscles or in the joint capsule is another discovery which should negative manipulation.

Some years ago I treated a man who, following a football injury, had his knee manipulated four times, twice by a medical man and twice by a bonesetter. Each time the knee became stiffer, until, when I saw him six months after the injury, the joint was perfectly stiff, and an X ray showed large plaques of bone in the vastus internus and in the inner side of the capsule. Resting the joint for a year on a splint restored mobility. I have since seen a second case of ossification in the capsule of the knee-joint, manipulated by the same bonsetter, again with the result that the knee was rendered much worse.

In manipulating a joint for adhesions it is necessary beforehand to determine exactly what movement is restricted or painful. Thus, I have seen a painful hip in which internal rotation in the flexed position was the movement restricted; and knees which require external rotation in full flexion and ankles which require plantar flexion and inversion are common.

Derangements of joints due to damage and displacement of an intra-articular meniscus constitute perhaps the most important group of cases in which manipulation is practised. Such a derangement may occur in the temporo-mandibular joint.

I saw some time ago a young woman who awoke one morning and found that she could not open her mouth. There was much pain in the left temporo-mandibular joint and the chin was deviated slightly to the left. After investigation of the teeth and jaw by an X ray an anæsthetic was administered and the jaw opened with a gag whilst the chin was lifted and the angle of the jaw brought forward. A loud snap occurred, and the jaw opened. On recovery from the anæsthetic it was found that full movement was present.

The Knee and Foot.

We all practise manipulation for derangement of the knee. In a clear case of locking of the joint resulting from injury to a semilunar cartilage with displacement occurring for the first time, I consider that such manipulation is the correct treatment. Often the disability will not recur. But this is only one of at least 12 possible causes of derangement, and in many cases the exact diagnosis is difficult. Manipulation will also cure cases of adhesions, of nipping of a synovial fringe, and some cases of partial locking due to an incomplete marginal tear of a cartilage, probably by completing the tear and displacing the cartilage into the intercondylar notch.

But manipulation cannot be expected to cure loose bodies, injuries of the crucial ligaments, cysts of the synovial membrane, or recurrent dislocation of the patella. Nor will it cure a complete bucket-handle split of the cartilage with recurrent displacement and locking. Accurate diagnosis of the exact lesion present is necessary, and it is to be feared that it is often not made. Diagnosis can only be improved by keeping very careful records of the history and signs and comparing them with operation findings.

A further point requires emphasis. At the present time an exploration of the knee-joint carried out by a competent and experienced operator is a perfectly safe proceeding. It is, in my opinion, often safer than a violent manipulation carried out in the dark with an incomplete preliminary diagnosis. Moreover, it promises a certain cure if a definite lesion is found, and this cannot be said of a manipulation. Therefore, whilst I believe that there are many cases in which we ought to manipulate and in which we may reasonably expect a cure by this method, I maintain that in many operation is essential, and in many others operation is the safest method. Failures after manipulation are extremely common, although they do not obtain publicity. Almost every case of derangement of the knee upon which I operate has been previously subjected to manipulation. I have operated upon as many as three in one week in which recurrence of symptoms had occurred after a bone-setter's manipulation.

I must say one word about the foot, which is responsible for many of the successes of bonesetters. Owing to the nature and fitting of our shoes the movements of the foot, and particularly of the toes, are habitually cramped, and the intrinsic muscles go out of action. It is particularly so in women, because they favour a short shoe and a high heel, often so cut as to throw the whole weight on to the forepart of the foot. The result is the loss of the metatarsal arch with clawing of the toes, which become hyperextended at the metatarso-phalangeal joints and flexed at the distal joints. The bone-setter announces that the toes are dislocated, and by manipulating them restores their mobility and gives comfort to the patient. It was formerly my practice to manipulate many of these cases under an anæsthetic and with great success. I have found, however, that with due training a good masseuse can cure this condition easily in a few treatments. The work of the massage profession, which was for long stereotyped on Swedish lines, has improved enormously during recent years as the result of close coöperation with the surgical profession. This is particularly true of the treatment of injuries. In fact, very often a good masseuse knows more of the practical treatment of injuries than the medical man. The student and the house surgeon learn far too little of this branch of treatment and gain too little experience in it. If we wish to avoid the reproach that the medical profession pays no attention to manipulative surgery, we must find room for a greater amount of teaching, and for better teaching, of this branch of surgery. The material is there; the methods are used and practised; the men are there to teach, if they are only given an opportunity.

LONDON CLINICAL SOCIETY.—The inaugural meeting of this new medical society will be held on Thursday, Feb. 18th, at the London Temperance Hospital, Hampstead-road, N.W., when Sir W. Arbuthnot Lane will give an address entitled Is Civilisation a Failure? All medical men and women will be welcome at this meeting. The society has been founded mainly with the object of bringing together the medical men and women resident in the north, north-west, and west-central districts of London, but membership is open to all registered medical men and women. The annual subscription is at present fixed at 5s., with an entrance fee of the same amount. The following are the officers of the society: President, Mr. Herbert J. Paterson; vice-presidents, Dr. Soltau Fenwick and Dr. A. J. Clarke; hon. treasurer, Dr. E. A. Gregg; hon. secretary, Dr. Philip Figdor, 150, Harley-street, W. 1, from whom further particulars can be obtained.

A STUDY OF THE EFFECT OF PASTEURISATION

ON THE INFECTIVITY OF THE MILK OF TUBERCULOUS COWS.

BY R. G. WHITE, M.B. GLASG.

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THE literature on the subject of the viability of the tubercle bacillus, when acted upon by heat at various temperatures and for various times, is full of contradictory statements, and this is especially the case in connexion with the vexed question of the effect of pasteurisation on the infectivity of tubercle-infected milk. The literature for the period from 1882 to 1907 on so-called death-point determinations of tubercle bacilli is summarised by Rosenau (1908), and from his own work on the subject, experimenting with milk heavily infected with virulent cultures, he arrived at the following conclusion:—

> "From these experiments it is evident that tubercle bacilli in milk lose their infective properties for guinea-pigs when heated to 60° C. and maintained at that temperature for 20 minutes, or to 65° C. for a much shorter time."

In the course of a controversy on this subject in the German literature (1908–10) Van der Sluis (1909) summarised the results of investigations up to the year 1909, and agreed with de Jong (1908) that one hour at 80° C. was necessary to kill tubercle bacilli in milk; this also was the opinion of Basenau (1909). In these experiments both naturally and artificially infected milks were used. Forster (1909, 1910) criticised this work and came to the conclusion that tubercle-infected milk when heated to a temperature of 65° C.–66° C. and held at this temperature for 15 minutes was no longer capable of giving rise to tuberculous infection in guinea-pigs. As a result of investigations carried out in America, the U.S. Department of Agriculture since 1910 has recommended that milk be heated to 145° F. and held for 30 minutes.

A table giving the results of various inquiries on this subject appears in a report by Delépine (1914) to the Local Government Board. Campbell Brown (1923), as the result of his own investigations, agrees with the results of the majority of the various workers quoted in this table which he also reproduces. He found that a temperature of 60° C. and a period of "holding" of 20 minutes was sufficient to prevent milk infected with laboratory-grown cultures of tubercle bacilli from infecting guinea-pigs when inoculated subcutaneously.

Object of Present Inquiry.

The object of this inquiry was to determine whether or not the milk of tuberculous cows is rendered non-infectious for guinea-pigs when the milk is heated to 145° F. (approx. 62·5° C.) and held at this temperature for a period of 30 minutes—the milk being afterwards rapidly cooled. The temperature (145° F.) and the time (30 minutes) had been chosen as being the limits which should not be exceeded if the nutritive qualities of the milk were not to be materially altered, and were in accordance with the findings of Rosenau and the recommendations made by the American Government for the commercial pasteurisation of milk. Objection has been taken to the use of artificially infected milk in such tests as those carried out by Rosenau, and one of the main objects of the present inquiry was to carry out tests with naturally infected milk.

Nature and Extent of Infection of Milk Used.

Great difficulty was experienced in obtaining a suitable cow for the purposes of the tests, so that the first four tests were carried out with artificially infected milk. The first test was made with milk to which had been added a weighed quantity of a laboratory-grown culture of tubercle bacilli. The strain

was kindly supplied by Dr. Schütze, of the Lister Institute, who had recently recovered it from a monkey dead of the infection. The culture was the second subculture after separation of the organism, and was highly virulent for guinea-pigs. This test was carried out in test-tubes (eight) each containing 4·5 c.cm. of infected milk; these formed a series of 1 in 10 successive dilutions containing approximately from 2500 million T.B. in the first tube to 25 T.B. in the last tube of the series. For the second test 15 mg. of two stock laboratory strains of T.B. were used to infect 1 litre of milk. These strains, both bovine, were kindly supplied by Dr. St. John Brooks from the National Collection. In this test the milk contained approximately 15 million T.B. per c.cm.

In order to simulate more closely the conditions as they exist in naturally infected milk, for the third and fourth tests, the milk to be tested was emulsified with ground-up caseous matter and glands from guinea-pigs infected with milk from the first of the two experimental cows used in connexion with the tests. The artificially infected milk for these two tests (Nos. 3 and 4) was found by inoculation into guinea-pigs to contain at least 10,000 infective T.B. per c.cm. The remaining tests were carried out with naturally infected cow's milk.

For these experiments the first cow obtained, although showing distinct evidences of tuberculous mastitis and giving a positive tuberculin reaction, yielded a milk which on microscopical examination of the centrifuged deposit and cream showed the presence of acid-fast bacilli on two only out of many examinations, and after prolonged search. In order to obtain some idea of the extent of the infectivity of the milk, daily tests were carried out for a period of a week, guinea-pigs being inoculated with graded dilutions of each day's yield of milk, and the result was practically constant—viz., 0·1 c.cm. gave a positive and 0·01 c.cm. an invariably negative result. Although a more heavily infected milk would have been desirable, still, owing to the difficulties which had been experienced in obtaining a suitable cow, it was decided to proceed with the tests. Shortly afterwards, however, the secretion of milk stopped and the cow had to be slaughtered. The tissues of guinea-pigs which had been infected with the milk of this cow were used in two of the tests (Nos. 3 and 4).

Ultimately a second cow was obtained; this cow also showed clinical signs of tuberculous mastitis and gave a positive tuberculin reaction, and on microscopical examination of the centrifuged milk acid-fast bacilli were constantly found. Inoculation of guinea-pigs with dilutions of the milk gave a positive result with 0·0001 c.cm. and a negative with 0·00001 c.cm. The remaining tests were carried out with the milk of this cow—the milk containing as a minimum 10,000 infective doses of tubercle bacilli per c.cm. In order to allow for any variation in the number of tubercle bacilli passed daily in the milk, the litre of milk to be tested was usually taken from a mixture of more than one day's yield of milk. For two of the tests, in order to obtain a still more heavily infected milk, daily samples of the cow's milk (2 pints) were centrifuged on arrival at the laboratory, and the cream and deposit separated and stored in the cold room. For one of these tests (No. 9) the cream and deposit of seven days' samples were emulsified in a mortar and made up to a litre with the separated milk—the resulting emulsion being used for the test. For the other test (No. 10) six days' samples were similarly treated. In the latter case guinea-pigs were inoculated with successive 1 in 10 dilutions from 0·1 to 0·000001 c.cm. and all were found to be infected so that the milk in this case contained at least 1 million infective doses of tubercle bacilli per c.cm.

Method of Pasteurisation: Technique Employed.

As regards the details of the method of pasteurisation, all the tests with the exception of the first were carried out on the same lines:—

After taking samples, for purposes of control, of the milk to be tested, 1 litre of the milk was poured into an earthenware pot. The type of pot used was a domestic cooking vessel bought in one of the larger stores and labelled "The Gourmet Boil'a, Challis patent No. 7"; it is slightly raised on three legs and the wall is about a quarter of an inch thick. This pot containing the milk to be tested was placed in a pan of water at about 80° C., and by means of a ring burner the water was kept near the boiling-point in order to raise the milk to the desired temperature (62·5° C.) as quickly as possible. The hot-water pan was covered with a lid through holes in which passed a mechanical stirrer and two thermometers—the stirrer and one of the thermometers passed into the milk and the other thermometer into the water in the outer chamber. To allow of the passage of the stirrer and thermometer into the milk a tin lid pierced with two holes replaced the earthenware lid supplied with the Gourmet Boil'a. During the heating the milk was constantly but gently stirred. The time taken to raise the milk to 62·5° C. was about eight minutes. As soon as this temperature was reached the Gourmet Boil'a was removed and placed in a constant temperature copper boiler—regulated at 62·5° C. By means of a similar arrangement to that used in the earlier or "pre-heating" stage, the milk was kept in gentle motion and with the aid of two thermometers the temperature of the milk in the container and the water in the copper boiler could be read off. After 30 minutes "holding" at the temperature of 62·5° C. the milk container was removed and rapidly cooled to about 30° C. by placing it in a bucket of ice and water, the stirring at this stage being carried out by hand.

In the first test the dilutions of infected milk in test-tubes were heated rapidly in an ordinary water bath to 62·5° C. and maintained at this temperature for 30 minutes. In this test the milk was not mechanically stirred. Any variation in the general method of carrying out the test as, for example, in test No. 2 where the milk was kept in motion by a current of air, is given in the detailed description of the various tests.

Manipulation of Pasteurised Milk.—In order to test as large a volume as possible of the pasteurised milk, the whole litre of milk after pasteurisation was spun in a high-speed centrifuge and the cream and deposit were used for inoculation.

Technique of Animal Tests.

For the results of the tests reliance was placed entirely upon animal experiments.

Guinea-pigs were inoculated subcutaneously into the fold of the groin and all surviving animals were allowed to remain for periods up to three months before being killed and examined. With one exception, a series of control animals was inoculated in every test, four or five guinea-pigs receiving respectively 1·0 c.cm. and successive 1 in 10 dilutions of the milk, from 0·1 c.cm. to 0·001 c.cm. or 0·0001 c.cm. In the remaining tests, which were each carried out with 1 litre of milk, four or five guinea-pigs were inoculated, two with 2·0 c.cm. to 4·0 c.cm. of the cream emulsified in a small quantity of the separated milk, and the remainder with all the deposit divided amongst them. The total deposit was made up to 6·0 c.cm. with separated milk and guinea-pigs were inoculated—either three guinea-pigs with 1·0, 2·0, and 3·0 c.cm. respectively, or two guinea-pigs with 3·0 c.cm. each of the emulsified deposit.

In the earlier tests cultures on glucose-agar and Dorset medium were made but, owing to the invariable presence of contaminating organisms, the use of cultures was discontinued. Autopsies were made on all the animals, and where there appeared to be any possibility of doubt, a second guinea-pig was inoculated from these, as in the case of certain animals with abscesses showing the presence of acid-fast bacilli of the butter bacillus type. As a general rule, the post-mortem findings were absolutely definite, the animals inoculated with the raw milk were either dead by the sixth week or were killed at this date, and the post-mortem findings were typical. In the case of the animals inoculated with the cream and deposit of the milk after pasteurisation (with the exception of one positive finding, which is dealt with later), and the guinea-pigs which were infected with a butter bacillus, these animals had grown considerably and had put on fat, so that a post-mortem examination might not have been considered necessary. It was, however, carried out in every case.

Details of Tests.

SERIES 1.—*Experiments with milk infected with T.B. cultures.*

TEST 1.—Carried out in test-tubes: 5 mg. of a glycerine-agar culture of a virulent strain of tubercle bacilli emulsified in 1·0 c.cm. saline and a 1 in 10 dilution made by adding it to 9 c.cm. milk. From this successive decimal dilutions were made, and by halving the contents of each tube two series of dilutions were obtained—each series consisting of eight tubes containing 4·5 c.cm. of milk in each tube and with approximately 2500 million T.B. in the first and 25 T.B. in the last tube. One set of these tubes was heated as described and the other set retained for purposes of control.

(1) *Control animals*, inoculated with milk before pasteurisation. Four guinea-pigs inoculated with 3·0 c.cm. of the contents of the first, fourth, sixth, and seventh of the series of unheated tubes (the last and weakest of these containing approximately 160 T.B.).

Result.—All ultimately found to be infected.

(2) *Test animals*, inoculated with milk after pasteurisation. Eight guinea-pigs inoculated with 3·0 c.cm. of the contents of each of the heated tubes (the highest of these doses containing approximately 1600 million T.B.).

Result.—All proved to be non-infected.

TEST 2.—Carried out in the improvised pasteurisation plant described—1 litre of milk used for the test; stirring carried out by passing a current of air through the milk; with this exception procedure as described. Subcultures on Dorset medium of two bovine strains of tubercle bacilli used to infect 1 litre of milk—15 mg. of culture being used.

(1) *Control animals*, inoculated with milk before pasteurisation. A series of successive 1 in 10 dilutions of the infected milk made, and of these five dilutions (1 c.cm. of each) inoculated into guinea-pigs (the last and weakest of these containing approximately 1 million T.B.).

Result.—All in due course found to be infected.

(2) *Test animals*, inoculated with milk after pasteurisation. Milk centrifuged and cream and deposit separated; 2 c.cm. and 5 c.cm. of the cream inoculated into two guinea-pigs and all the deposit—divided into 1/6th, 2/6th, and 3/6th, inoculated into three guinea-pigs.

Result.—All animals non-infected.

SERIES 2.—*Experiments with milk infected with tuberculous glands.* (Proved by animal inoculation—see below—to contain at least 10,000 infective T.B. per c.cm.)

TEST 3.—1 litre of milk infected with the ground-up glands (caseous lymphatic glands and spleen) of guinea-pigs infected by subcutaneous inoculation of the milk of first experimental cow. The guinea-pigs showed extensive tuberculous infection. The glands were ground up in a mortar and an emulsion made with part of the cream separated from the litre of milk with which the experiment was to be carried out. Emulsion made as homogeneous as possible in large mortar and remainder of milk added and again emulsified. The artificially infected milk was then poured into the Gourmet Boil'a through a muslin cloth, similar to that used commercially for straining milk, to remove the grosser fragments of tissue.

(1) *Control animals*, inoculated with milk before pasteurisation; 1·0 c.cm. and dilutions of 0·1, 0·01, 0·001, and 0·0001 c.cm. of the infected milk inoculated subcutaneously into guinea-pigs.

Result.—All in due course showed marked tuberculous infection.

(2) *Test animals*, inoculated with milk after pasteurisation. Five guinea-pigs inoculated respectively with 2·0 c.cm. and 4·0 c.cm. of the cream and 1/6th, 2/6th, and 3/6th of whole deposit of the centrifuged milk after passing through the pasteurisation process.

Result.—Guinea-pig receiving 2/6th of the deposit dead of sepsis two days after inoculation, remaining animals killed three months after date of inoculation and showed no signs of tuberculous infection.

TEST 4.—1 litre of milk infected with ground-up glands of tuberculous guinea-pigs and procedure as in former test.

(1) *Control animals*, inoculated with milk before pasteurisation; 1·0 c.cm. and decimal dilutions to 0·0001 c.cm. inoculated into guinea-pigs.

Result.—All in due course showed typical tuberculous lesions.

(2) *Test animals*, inoculated with milk after pasteurisation. After centrifugalisation of pasteurised milk two guinea-pigs each inoculated with 5·0 c.cm. of the cream.

Result.—One dead of sepsis, the other killed and examined 65 days after inoculation. No signs of tuberculous infection found.

The deposit of 5/6th of the litre of milk (1/6th was lost by the breaking of one of the centrifuge pots) inoculated in the proportion of 1/6th, 2/6th, and 3/6th into three guinea-pigs; these animals examined 65 days after inoculation.

Result.—Found to be non-infected.

TEST 4 (*a*).—Carried out in order to get some idea of the numbers of infective tubercle bacilli left in the milk after the first stage—i.e., after it had been raised to the temperature of 62·5° C. Samples were taken of the milk as soon as the container was removed from the pre-heater and placed in the holder, the milk having been at a temperature of 62·5° C. for less than five minutes—possibly only for three minutes. Five guinea-pigs were inoculated respectively with 1·0 c.cm. and decimal dilutions to 0·0001 c.cm.

Result.—All in due course gave a negative result.

SERIES 3.—*Experiments with naturally infected milk.*

TEST 5.—1 litre of milk from one day's yield of experimental cow used.

(1) *Control animals*, inoculated with milk before pasteurisation; 1·0 c.cm. and decimal dilutions to 0·0001 c.cm. of unheated milk inoculated into guinea-pigs.

Result.—After six weeks all proved to be infected.

(2) *Test animals*, inoculated with milk after pasteurisation. Five guinea-pigs inoculated—two with cream and three with the deposit divided amongst them as in former test.

Result.—Four animals after two and a half months gave a negative result and the fifth, which had received 4·0 c.cm. of the cream, died of sepsis.

TEST 6.—1 litre of a mixed sample of four days' yield of the experimental cow's milk used.

(1) *Control*, before pasteurisation. Five guinea-pigs inoculated with 1·0 c.cm. and decimal dilutions to 0·0001 c.cm. of the unheated milk.

Result.—After six weeks all proved to be infected.

(2) *Test*, after pasteurisation. Five guinea-pigs inoculated—two with cream and three with the deposit divided amongst them.

Result.—Four animals after 62 days showed no evidence of tuberculous infection; the fifth, which had received 4·0 c.cm. of cream, died of sepsis.

TEST 7.—1 litre of mixed sample of five days' yield of the experimental cow's milk used.

(1) *Control*, before pasteurisation. Four guinea-pigs inoculated respectively with 1·0 c.cm. and successive decimal dilutions to 0·001 c.cm. of the unheated milk.

Result.—After five weeks all proved to be infected.

(2) *Test*, after pasteurisation. Four guinea-pigs inoculated—two each with 3·0 c.cm. of the cream and two each with half of the deposit.

Result.—Of the former, one gave a negative result and the other died of sepsis four days after inoculation. Of the latter two, those which received deposit, one died five weeks after inoculation and showed distinct signs of tuberculosis, the other was killed and examined two and a half months after inoculation and showed no signs of tuberculous infection, the animal having increased in weight and put on fat.

TEST 8.—1 litre of mixed sample of six days' yield of the experimental cow's milk used.

(1) *Control*, before pasteurisation. Four guinea-pigs inoculated respectively with 1·0 c.cm. and successive decimal dilutions to 0·001 c.cm. of the unheated milk.

Result.—After five weeks one died of advanced tuberculosis, and the other three were killed and examined and found to be infected.

(2) *Test*, after pasteurisation. Four guinea-pigs inoculated—two each with 3·0 c.cm. of the cream and two each with half of the deposit.

Result.—No signs of tuberculosis were found in these pigs when killed and examined two and a half months later.

TEST 9.—1 litre of mixed sample of seven days' yield of the experimental cow's milk used.

(1) *Control*, no control animals inoculated.

(2) *Test*, after pasteurisation. Four guinea-pigs inoculated—two each with 3·0 c.cm. of the cream and two each with half of the deposit.

Result.—Three months after inoculation two of former and one of the latter killed and examined and showed no signs of tuberculous infection; the fourth animal died of sepsis.

TEST 10.—2 pints of each day's yield of milk for six days centrifuged; cream and deposit separated and kept in the ice-room. The collected samples of cream and deposit mixed for the test and made up to 1 litre with the separated milk.

(1) *Control*, before pasteurisation. Five guinea-pigs inoculated, each with 1·0 c.cm. of successive decimal dilutions representing from 0·01 c.cm. to 0·000001 c.cm. of the original milk.

Result.—All in the course of four to six weeks gave a positive result.

(2) *Test*, after pasteurisation. Four guinea-pigs inoculated—two each with 3·0 c.cm. of the cream and two each with half of the deposit.

Result.—The two former were killed three months after inoculation and gave a negative result. The two latter died of sepsis three days after inoculation.

TESTS 11, 11 (*a*), 11 (*b*).—For these tests three separate litres of a mixed sample of five days' yield of the experimental cow's milk used—1 litre for each test. The three tests were carried out as before with the exception that the period of "holding" was varied as follows:—

11	.. ..	Milk held for 30 min. at 62·5° C.
11 (*a*)	.. ..	,, ,, 20 ,, ,,
11 (*b*)	.. ..	,, ,, 10 ,, ,,

(1) *Control*, before pasteurisation. Five guinea-pigs inoculated, each with 1·0 c.cm. of successive decimal dilutions representing 0·01 c.cm. to 0·000001 c.cm. of the mixed milk.

Result.—The first three gave a positive result, whilst those inoculated with dilutions of 0·00001 c.cm. and 0·000001 c.cm. were not infected.

(2) *Test* 11—i.e., after milk was held for 30 minutes. Four guinea-pigs inoculated—two each with 3·0 c.cm. of the cream and two each with half of the deposit.

Result.—No evidences of any tuberculous infection found in these animals.

Test 11 (*a*)—i.e., after milk was held for 20 minutes. Four guinea-pigs inoculated—two each with 3·0 c.cm. of the cream and two each with half of the deposit.

Result.—The two former gave a negative result whilst the two latter died of sepsis.

Test 11 (*b*)—i.e., after milk was held for 10 minutes. Four guinea-pigs inoculated—two each with 3·0 c.cm. of the cream and two each with half of the deposit.

Result.—The two former gave a negative result, whilst the latter were both infected with an acid-fast organism of the butter bacillus type; neither these animals nor the guinea-pigs inoculated with material from them gave any signs of a tuberculous infection.

Summary of Results.

All control animals, inoculated with dilutions of the unheated milk, gave a positive result, except where the dilutions were taken to a point beyond the infective dose. The following table gives the results of the test guinea-pigs—those which had been inoculated with the milk after it had been subjected to the pasteurisation process described either as in the first test in the form of dilutions of the infected milk, or as in the other tests with the cream and deposit of the centrifuged milk.

Series I. includes tests on artificially infected milk (T.B. cultures).

Series II. includes tests on artificially infected milk (caseous lymphatic glands, &c.).

Series III. includes tests on naturally infected milk (experimental cow's milk).

Series IV. includes tests where milk was held for periods of less than 30 minutes).

Series.	Test.	G.P. inoculated and total.	Negative.	Positive.	Died of other infections.	Series.	Test.	G.P. inoculated and total.	Negative.	Positive.	Died of other infections.
I.	1	8	8	—	—	III. (*cont.*)	8	4	4	—	—
	2	5=13	5	—	—		9	4	4	—	—
							10	4	2	—	2
II.	3	5	5	—	—		11	4=30	4	—	—
	4	5=10	4	—	1						
						IV.	4 (*a*)	5	5	—	—
III.	5	5	4	—	1		11 (*a*)	4	2	—	2
	6	5	4	—	1		11 (*b*)	4=13	3	—	1
	7	4	2	1	1						

It will be seen that out of a total number of 53 guinea-pigs inoculated with artificially infected and naturally infected milk, after it had been heated as described to 62·5° C. and held at this temperature for 30 minutes, six died either as the result of sepsis or from infection with an organism of the butter bacillus type. Of the remaining 47 animals, 46 gave a negative result and one showed a definite tuberculous infection. With regard to this one positive result it is to be noted that the whole deposit of the litre of milk, after centrifugalisation, was inoculated into two guinea-pigs—each receiving one-half of the deposit. As the other animal of the pair showed absolutely no signs of infection and the one referred to was unmistakably positive—the possibility of an accident cannot be overlooked. Every care was taken with regard to using separate pipettes, syringes, &c., also with the labelling and care of the guinea-pigs, but as each test took about three hours to carry out and as each detail as to temperature, &c., had to be personally controlled, it is possible that an accident may have occurred. This result, which proved to be the one exception in the tests, I am therefore inclined to interpret in this light.

With regard to the three special tests (Series IV.) these were carried out as a matter of interest and were apart from the main line of investigation. It was considered that the sterilisation of the milk so far as tubercle was concerned would no doubt follow the same laws as are found to hold in the case of disinfection with chemical compounds, and that the death point of the organism would follow a logarithmic curve when plotted out as a function of time and temperature. A detailed investigation on these lines was beyond the scope of this inquiry, but by keeping the temperature constant it was hoped that varying the time might give some indication of the rate of change in the milk from an infective to a non-infective condition. The tests carried out were too incomplete to enable definite conclusions to be drawn, but it is worthy of note that in the case of the first of the special tests (Test No. 4 (*a*)), where the milk was tested shortly after it had been raised to 62·5° C. (with less than five, possibly three, minutes holding at this temperature), five guinea-pigs inoculated respectively with 1·0 c.cm. and successive decimal dilutions to 0·0001 c.cm. all gave a negative result. This milk before pasteurisation was shown by control inoculations into a series of guinea-pigs to contain a minimum of 10,000 infective doses of T.B. per c.cm. Unfortunately, larger doses than 1·0 c.cm. were not inoculated.

As to the other two special tests (Nos. 11 (*a*) and 11 (*b*)) in which the milk (1 litre) was heated to 62·5° C. but held for shorter periods than 30 minutes—viz., 20 minutes in the case of the first test and 10 minutes in the second—the results were complicated by the presence of extraneous organisms. It is of interest, however, to note that no evidences of a tuberculous infection were found in the two surviving guinea-pigs out of four inoculated in the first nor in three out of four inoculated in the second of these tests.

Conclusions.

Experiments have been carried out with naturally infected milk from cows with tuberculous udders, with milk contaminated with cultures of tubercle bacilli, and with milk to which ground-up caseous tuberculous glands have been added. The method employed was to raise the temperature of the milk to 62·5° C. and to keep it at this temperature for 30 minutes. The results obtained by inoculating such pasteurised milk into guinea-pigs have shown clearly that pasteurisation carried out under these conditions ensures a non-infective milk so far as *B. tuberculosis* is concerned.

I am greatly indebted to Prof. C. J. Martin and Prof. J. C. G. Ledingham for their advice and suggestions, and to Mrs. M. M. Barratt for much valuable help.

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A CASE OF PERNICIOUS ANÆMIA OF APLASTIC TYPE,

WITH PHAGOCYTOSIS OF ERYTHROCYTES.

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IN this case the clinical findings and blood pictures were similar to those found in the aplastic type of pernicious anæmia occurring among munition workers during the late war. It is a significant fact that the patient was by trade a "film varnisher"—an occupation involving the continuous use of some form of "dope"—but we have been unable to trace any previous cases of disease among such workers or to find any evidence for the occupation being the primary cause of the disease.

The patient, A. C., aged 51, was admitted to the Middlesex Hospital under Dr. C. E. Lakin in March, 1924. He complained of soreness of tongue and mouth, and chronic diarrhœa with abdominal pain, all of about three months duration. He had been compelled to cease work a month before admission on account of lassitude, dizziness, and pains in the lower limbs. He had never been abroad.

Condition on Examination.—The patient was emaciated and anæmic; teeth very decayed, and tongue, mouth, and fauces painful and ulcerated. The tongue showed numerous eroded patches and superficial cracks, whilst margins of gums were ulcerated and exuded a foul discharge. The whole condition of the mouth was suggestive of sprue, but no other sign of this disease was found. The circulatory, respiratory, and urinary systems were normal.

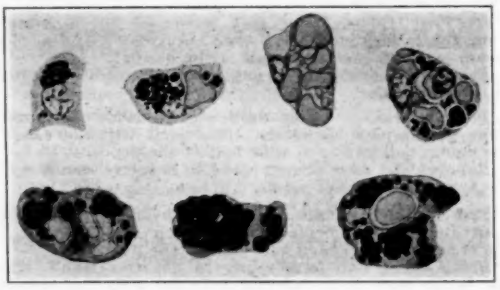
Condition on Admission.—The temperature was subnormal, but afterwards remained slightly raised. The diarrhœa was relieved by rectal wash-outs with a solution of borax. The mouth condition was treated by irrigation and mouth washes, the teeth being cleaned up with a solution of citric acid. Iron and arsenic were given intramuscularly and by the mouth. Four weeks after admission severe vomiting after food began. The patient became thinner and paler and died painlessly of asthenia ten weeks after admission, having been comatose during the last fortnight. Bacteriological examinations of the stools showed nothing abnormal. Examinations of the blood were made at weekly intervals. No nucleated forms of red corpuscles were ever found, but the films were notable for the large numbers of megalocytes present. The colour-index was usually over 1. The results are recorded in the table.

Blood Examinations.

Date in 1924.	Erythrocytes (in millions).	Hæmoglobin.	Colour-index.	Leucocytes.	Polymorphonuclears %	Lymphocytes %	Large mononuclears %.	Eosinophiles %.
2/4	1,920	36	0·9	2,800	58	36	5	1
9/4	1,200	38	1·6	2,700	46	48	6	0
17/4	1,780	36	1·0	3,400	58	36·5	5·5	0
29/4	1,800	32	0·9	4,900	60	32	8	0
6/5	1,770	30	0·9	4,500	61·5	36·0	2·5	0
16/5	1,480	30	1·07	3,100	57·5	37·25	5·25	0
21/5	1,500	28	0·9	—	—	—	—	—
24/5	1,040	22	1·1	3,000	49·0	46·0	5·0	0

Remarks.—April 2nd, 9th, 17th, 29th, May 6th, 16th: Large numbers of megalocytes. Few poikilocytes. May 21st: Platelets 20,000 per c.mm. May 24th: Platelets nil seen. Megalocytes very numerous.

Post-mortem Examination.—The main post-mortem findings were syphilitic aortitis and a small dark fibrous spleen. The liver gave a faint reaction for iron with potassium ferrocyanide and hydrochloric acid, the blue colour appearing after about three minutes. The diploë of skull and marrow of ribs and sternum were light yellow in colour. The marrow of right femur was yellow and fatty throughout its entire length except for an area occupying upper third of shaft and extending slightly into the neck of the bone, which was somewhat soft and creamy red in colour. Wassermann reaction, performed post mortem, positive. Several blood films and a section of blood clot were examined from post-mortem material, but no nucleated forms of red cells were found. A section of liver showed that the cells contained a quantity of iron pigment in the state of fine granules, but there was no destruction of liver tissue. A section of the area of reddish marrow in the femur showed both leucoblastic and erythroblastic cells. Myeloblasts and various forms of myelocyte were present. All stages of development of red blood-cell could be seen: megaloblasts with bluish-purple protoplasm, others more hæmoglobinised but still retaining the megaloblast nucleus; normoblasts, some of large size, normal-sized red cells and megalocytes in fair numbers. In addition to above, and forming the most striking feature of sections, were very numerous phagocytic cells. These were variable in size and shape; some spherical, others oval or irregular, and most of them of large size. The pale staining reticular nucleus of these cells lay usually towards the periphery of the cell and was oval or kidney-shaped; the protoplasm, faintly staining and often hardly visible, was, in the majority of cases, stuffed with red cells and pigment. Every form of red cell—megaloblasts, normoblasts, and mature cells—could be found within these



Drawing of a series of phagocytes found in sections of the bone-marrow. The upper four cells stained by Leishman's stain, the lower three stained to show the coarse granules of iron pigment.

phagocytes; they also occasionally contained leucocytes. The pigment, which was found exclusively within the phagocytes, was in the form of brownish granules ranging in size from fine particles up to half the size of a red cell. Sections stained for free iron, when viewed with the low power, showed blue spots scattered thickly over the field; with the one-twelfth objective these spots were seen to be phagocytes laden with blue iron containing granules of varying sizes corresponding to the brownish pigment granules. (See figure.) Coliform bacilli in clumps were evident in one or two places in the bone-marrow section.

Phagocytosis of Red Cells.

Phagocytosis of red cells by cells of the liver, spleen, lymph glands, and bone-marrow has frequently been described, and Aschoff [1] has drawn attention to the fact that it may sometimes become the predominant factor in blood destruction. Peabody and Broun [2] have found that a certain amount of phagocytosis of erythrocytes occurs in normal bone-marrow, and to a greater extent in a variety of pathological conditions, particularly cirrhosis of the liver, and infectious diseases such as typhoid, tuberculosis, and pneumonia; but in no disease have they found the phenomenon so marked as in the acute stage of pernicious anæmia, of which they examined ten cases. Their description of the latter is remarkable in that the phagocytes contained large numbers of red cells, but less pigment than the control cases. Turnbull's [3] findings in sections of the bone-marrow from a case of aplastic anæmia due to tri-nitro-toluene poisoning are very similar to our case.

The question naturally arises as to whether the anæmia is due to the phagocytosis or whether the phagocytosis is merely a removal of damaged cells and of pigment, both of which are the product of some other agent. The histological evidence indicates that the bone-marrow phagocyte ingests the red corpuscle, and that the pigment is formed from the hæmoglobin within the phagocyte. This is suggested, in our case,

by the presence in the phagocytes of red cells—especially megaloblasts—which are apparently intact, and by the fact that the pigment was confined to the phagocytes. It is improbable that there would be such a complete phagocytosis of all pigment if this was originally formed outside the ingesting cells.

Significance of Megalocytes in Aplastic Anæmia.

The blood counts of this case showed a severe anæmia with the high colour-index characteristic of the pernicious type, whilst the entire absence of nucleated forms of red cells indicated that the anæmia was what is commonly described as "aplastic." Megalocytes were a notable feature in all blood films. These cells, so characteristic of pernicious anæmia, are usually regarded as the special product of the bone-marrow when stimulated by a toxin; undoubtedly they serve a useful function in severe anæmia, for they are usually fully hæmoglobinised and capable of carrying a large quota of oxygen. Their origin is obscure, though it is conceivable that they are a close relation of the megaloblasts, if the normal evolution of the erythrocyte as demonstrated by Turnbull [4] be accepted. Normally, the megaloblast is a cell with a reticular nucleus but with no hæmoglobin in its cytoplasm, and it becomes a normoblast by the condensation of its nucleus and cytoplasm. The young normoblast still possesses no hæmoglobin, but the acquisition of the latter substance by the normoblast coincides with the extrusion or disintegration of its nucleus and its conversion into a normal erythrocyte. Aschoff [5] states that megaloblasts are not found in normal marrow, but the evolutionary process, as described by him, is essentially the same as the above if one omits the first stage.

In severe anæmia the megaloblast is seen in the bone-marrow (and often in the peripheral circulation) as a hæmoglobinised cell, and there appears, therefore, to be a stimulus to an early and complete hæmoglobinisation of an immature red cell—a cell which normally contains no hæmoglobin. In parallel with the normal process, there should be a tendency for the cell to shed its nucleus coincident with its acquiring hæmoglobin. It seems reasonable to suggest, therefore, that megalocytes (which are frequently associated with hæmoglobinised megaloblasts) are non-nucleated forms of megaloblasts and that they provide a short cut from the megaloblast to a hæmoglobinised non-nucleated red cell in times of need.

Condition of Bone-marrow in Severe Anæmia.

The bone-marrow in cases of severe anæmia appears to react not only by producing large numbers of corpuscles to compensate for the destroyed cells, but also by hastening the hæmoglobinisation process, in an effort to provide cells of any kind so long as they are capable of carrying oxygen. In the ordinary plastic type of pernicious anæmia with the typical hyperplastic bone-marrow both these compensatory processes appear to be in action. In the classical case of aplastic anæmia described by Vaquez and Aubertin [6] both these processes were in abeyance, for no abnormal cells were found in the peripheral blood and there was no hyperplasia of the bone-marrow. In the series of cases of aplastic anæmia recorded among munition workers during the late war,[7] in the series of cases collected by Dyke,[8] and in our case anisocytosis has always been noted, but with little or no hyperplasia of the bone-marrow. In such cases, characterised clinically by an entire absence of remissions, the main compensatory mechanism appears to be the early hæmoglobinisation of such cells as are produced by the marrow. Our case showed a slightly hyperplastic area of bone-marrow in the femur, which on section showed that the main erythroblastic activity was megaloblastic and megalocytic—a fact which supports the view expressed above on the origin, function and significance of the megalocyte. In Dyke's series of cases stress is laid on the demonstration of a bacterial infection of the bone-marrow; this was present in our case also; we regard it as merely a terminal event in the course of the disease.

Our thanks are due to Dr. C. E. Lakin for permission to publish this case and to Dr. S. L. Baker for his report (embodied in the text) on the bone-marrow section.

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THE BIOCHEMICAL ACTION OF INTRAVENOUS ANTIMONY TARTRATE INJECTIONS.

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Antimony tartrate, either the potassium or sodium salt, is a simple inorganic compound of antimony with the tartrate acid radicle $(K(SbO)C_4H_4O_6)_2, H_2O$. It is readily soluble in water and other fluids, and when dissolved is not easily disintegrated. When injected into the blood stream in a concentration of 1 gr. in 2 c.cm. of water* it has no action on the cellular constituents of the blood nor upon the endothelial lining of the vessels, and remains, apparently, in simple solution in the serum. It seems, however, to have a selective action on certain organs, tissues, and cells, and within a few minutes of reaching the general circulation it has commenced to exert its physiological effects.

(A) *Physiological Effects.*

Discomfort or pain in the chest and a dry cough mark its presence in the mucous membranes of the bronchioles, a feeling of constriction in the throat its effect on the laryngeal mucous membrane, nausea, sickness, colic—and later diarrhœa—its presence in the mucous membrane of the bowel, a desire to micturate its effect on the urinary system, and dizziness or headache its effect on the cerebrum. These are all striking results indicating rapid and early physiological action, and yet when contrasted with the immediate physiological effects of oral, hypodermic, or intramuscular administration of the drug they are insignificant. There is, however, one alarming biochemical action which may follow intravenous administration—viz., shock. This effect is apparently not due to an overdose in the ordinary accepted use of the term, but rather to individual susceptibility or possibly true anaphylaxis. In such a case it may happen that an adult injected three times a week will, after a dose of 1½ gr., become clammy with perspiration and pale, will exhibit dilated pupils, sighing shallow respirations, general weakness, and painful extremities. If the dose be repeated after two days these signs and symptoms recur; in fact, once having upset the patient's antimony tartrate equilibrium in this way he appears to remain hypersensitive.

A later physiological effect of intravenous antimony injections is shown by rheumatic pains in joints—sufficient to prevent sleep—and even paresis of muscles. These rheumatic pains occur when the course is in full swing, come on some hours after an injection, and

* One grain or 0·065 gramme of antimony tartrate in two cubic centimetres of water. Throughout this paper the amount of the salt is given in grains and the amount of solvent in cubic centimetres.

last for six or eight hours. They are repeated after the next injection if the dose is not reduced. Still later physiological effects of intravenous injections of antimony tartrate are certain skin phenomena, most conspicuous in Africans with brown (Arabs) or black (Negro) skins. The first of these manifestations is an immediate temporary flush around the site of the injection—well seen in the white skin of Europeans—and an exaggeration of any rash which may be present—e.g., psoriasis. Later a condition of "goose-skin" may occur. In the case of a negro to whom 60 gr. had been given over a period of three months a leucoderma followed, producing a de-pigmentation

(B) *Clinical Tests.*

Psoriasis was chosen for these tests because of its chronic intractable, generally incurable, nature. The first case treated was that of a war pensioner with moderately severe psoriasis. After a number of injections the skin condition cleared and five years later there had been no return of the condition. The next case was that of a girl, aged 11, with intractable psoriasis of scalp, face, trunk, and limbs (she could not walk). She was given 23 gr. over a period of ten weeks and the psoriasis practically disappeared. Four other cases were also treated, all of them of long standing, with head, face, hands, legs, and feet affected; one had been in this condition for 14 years, a second for 14 years, and the other two for 8 and 4 years. All of them were incapacitated by their ailment. Although each case showed improvement after a few injections, it was not until after some months—in some cases with intervals of rest—that the psoriasis disappeared.

There is nothing sensational about these cases. The antimony acted probably not directly on the psoriasis—it does not act when applied locally—but indirectly through its general physiological effect on body tissues through which it produced a marked improvement on the clinical condition of the patients. Antimony has a marked effect on the liver, and it seems possible that some alteration of protein metabolism may be produced. A small dose may cause increased cellular activity, a larger dose cellular degeneration, and an actual toxic dose cellular destruction.

TABLE I.

Name.	Formula.	Per cent. antimony.	M.L.D. per K.	Weight of antimony in M.L.D.	100 parts water dissolve at 18° C.
1. Ethylenediamine A.T.	$C_{16}H_{18}O_{14}N_2Sb_2H_2O$	37·0	0·005	1·85	4·
2. Barium A.T.	$C_8H_8O_{14}Sb_2Ba.3H_2O$	31·63	0·01	3·2	0·49
3. Potassium A.T.	$C_4H_4O_7SbK.\frac{1}{2}H_2O$	36·17	0·106	5·7	7·2
4. Sodium p-bromo-phenylstibinate		34·71	0·019	6·6	—
5. Ammonium A.T.	$C_4H_3O_7NSb.1\frac{1}{2}H_2O$	36·51	0·02	7·4	66·0
6. Quinidine A.T.	$C_{24}H_{28}O_4N_2Sb.4H_2O$	17·61	0·02	3·5	0·31
7. Aniline A.T.	$C_{16}H_{15}O_7NSb.H_2O$	18·5	0·02	6·0	18·5
8. Quinotoxin A.T.	$C_{24}H_{28}O_4N_2Sb.1\frac{1}{2}H_2O$	18·85	0·023	4·0	25·0
9. Sodium A.T.	$C_4H_4O_7SbNa.\frac{1}{2}H_2O$	38·01	0·025	9·5	91·0
10. Hydroquinine A.T.	$C_{24}H_{31}O_4N_2Sb.5H_2O$	17·11	0·03	5·1	17·11
11. Lithium A.T.	$C_4H_4O_7SbLi.2\frac{1}{2}H_2O$	35·75	0·94	14·3	180·0
12. Butylamine A.T.	$C_8H_{14}O_7NSb.2H_2O$	30·48	0·045	15·0	238·0
13. Glyoxaline A.T.	$C_5H_3O_7N_2Sb.2H_2O$	30·87	0·045	16·0	46·7
14. Cinchonine A.T.	$C_{22}H_{23}O_4N_2Sb.\frac{1}{2}H_2O$	20·46	0·05	10·2	2·96
15. Cinchonidine A.T.	$C_{22}H_{27}O_4N_2Sb.2\frac{1}{2}H_2O$	19·24	0·05	9·6	1·37
16. Sodium phenylstibinate		46·56	0·072	33·4	—
17. p-Phenetidine A.T.	$C_{12}H_{14}O_4NSb.H_2O$	27·29	0·08	21·6	8·5
18. Sodium p-acetyl-amino-phenylstibinate	$C_{24}H_{22}O_{14}N_2Sb_2Na$	40·12	0·133	55·4	—
19. Quinine A.T.	$C_{24}H_{29}O_4N_2Sb.H_2O$	19·13	0·15	31·0	0·10
20. Sodium m-acetyl-amino-phenylstibinate	$C_{24}H_{22}O_{14}N_2Sb_2Na$	40·12	0·174	69·8	—

TABLE II.

Barium A.T.	$\left\{\begin{matrix}C_4H_4O_7Sb\\C_4H_4O_7Sb\end{matrix}\right\}$ Ba 3 H_2O	31·63	0·01	3·2	0·49
Potassium A.T.	$C_4H_4O_7SbK.\frac{1}{2}H_2O$	36·17	0·016	5·7	7·2
Ammonium A.T.	$C_4H_4O_7Sb.NH_4.1\frac{1}{2}H_2O$	36·51	0·02	7·4	66·0
Sodium A.T.	$C_4H_4O_7Sb.Na.\frac{1}{2}H_2O$	38·01	0·025	9·5	91·0
Lithium A.T.	$C_4H_4O_7Sb.Li.2\frac{1}{2}H_2O$	35·75	0·04	14·3	180·0

A.T. = Antimonyl tartrate.

resembling "piebald" skin. Still later, with larger doses, the patient may experience fullness and pain in the hepatic region, and even jaundice may supervene.

Death has occasionally been known to result from intravenous injection of antimony. An unpublished case is known to the writers in which a single dose of 13 gr. given inadvertently, owing to a mistake in dispensing, proved fatal in 12 hours to a case of bilharzia. This case is referred to below.

The toxic effect of antimony salts on animals may be seen from Table I., in which the salts are arranged in order of toxicity. This table has been compiled from the work of Fargher and Gray.[1]

In Table II. it should be noted that the most toxic contains the smallest percentage of antimony and is the least soluble.

The symptoms and signs which follow prolonged intravenous injections of antimony tartrate appear to be typically allergic. The patient becomes hypersensitive and intolerant of small non-toxic doses which would have no ill effects on an individual previously uninoculated. The phenomenon of drug allergy is now well recognised and has been described in connexion with glucosides, alkaloids, essential oils, certain metals, halogens, and coal-tar derivatives (Kolmer [2]). In the majority of cases the most marked effect appears to be produced on the liver and kidneys.

Apart from these signs and symptoms of hypersensitivity after the intravenous injection of antimony tartrate, two therapeutic effects are known: (1) parasito-tropic and (2) organo-tropic (Ehrlich). The former is well recognised in the treatment of tropical disease. The latter, however, is not so generally recognised, and it was with a view to elucidating some of the problems connected with this organo-tropic effect that the following clinical and experimental investigations were made.

(C) *Histological and Experimental Tests.*

The toxic effects of antimony salts on animal tissues have been chiefly investigated by oral administration. In such cases, as is well known, the effect is that of a gastro-intestinal irritant, and most of the published work lays stress on this particular aspect of the question. Remote effects on the liver, kidneys, and heart have been noted, and Wynter Blyth [3] quotes experiments by Levin on rabbits fed by mouth with antimony, in which these effects on the viscera were observed. Korns [4] has also recorded a series of experiments on rabbits, injected intravenously, in which fatty degeneration of the liver is mentioned as occurring in several cases.

An opportunity was given us of examining sections of the viscera from a man suffering from bilharzia

who was given intravenously 13 gr. of antimony tartrate by mistake. The liver showed signs of marked degeneration, the protoplasm of the hepatic cells was granular, vacuolation was marked, whilst the nuclei of the cells stained badly or not at all. The blood capillaries were distended and here and there were small patches of blood pigment. The interstitial tissue of the organ was also largely destroyed except immediately round the vessels. In the kidney there was, in certain portions of the organ, almost complete destruction of the epithelium of the tubules, especially of the convoluted tubules, with an invasion of leucocytes around, whilst the glomeruli were also degenerated and structureless. In other areas the destruction of the tubules had not progressed so far, a certain amount of detail could still be made out, and the glomeruli were intact. In these areas the vessels were dilated and leucocytic migration had occurred.

The following experiments were made with the object of investigating these questions further in animals.

Four rabbits were inoculated intravenously with varying doses of antimony tartrate in distilled water. The first animal was given ¼ gr. in 0·25 c.cm. water. The rabbit died during the night and was found to have hæmorrhage into the lungs and spleen, pericardial effusion, and the bladder distended with urine. Sections of the lungs showed dilatation of blood capillaries with minute extravasations of red blood corpuscles. The kidneys exhibited cloudy swelling of the cells of the convoluted tubules and dilatation of capillaries. In some tubules there was definite vacuolation of the cells. The straight tubules appeared to have escaped damage. The spleen showed two or three areas of hæmorrhage beneath the capsule, but no other changes were noted. The liver showed granular protoplasm in the hepatic cells.

The second rabbit received ½, ¼, and ¼ gr. of antimony tartrate in 0·25, 0·5, and 1 c.cm. water respectively, at intervals of 48 hours. The animal died the day after the last injection. At the autopsy there was a small pericardial effusion, the bladder was distended with urine, the lungs congested and showing a few patches of hæmorrhage. Histologically the most marked change was in the liver, in which the hepatic cells of the lobules showed degeneration and vacuolation.

The third rabbit received ¼ gr. in 1 c.cm. water and died two days later. Here again the autopsy revealed pericardial effusion with dilated vessels in the pericardium, hæmorrhage in the lungs and spleen, peritoneal effusion, and a distended bladder. The liver was pale, and sections showed degeneration and vacuolation of hepatic cells as in the previous case.

The fourth rabbit, weighing 2 kilos, survived nine injections given during the course of 16 days, the doses rising from ¼ to ½ gr. and totalling 4½ gr. The rabbit became ill the day after the last injection and died 24 hours later. At the autopsy the pericardium and peritoneum contained small effusions and the liver was pale, but no other lesions were noted. On section the liver showed very marked degeneration and vacuolation of the hepatic cells with destruction of nuclei; the central portions of the lobules were most affected.

An attempt was next made to protect a rabbit of approximately the same weight against the toxic effect of intravenous injections of antimony tartrate by injecting—again intravenously—5–15 minutes after each dose of antimony a solution of sodium thiosulphate. The animal was given eight injections of antimony, rising from ¼ to 1 gr. and totalling 4½ gr., during a period of 23 days. Each injection was followed by sodium thiosulphate, 0·6 gr. in the first three injections and 1·2 gr. in the others.

A control rabbit inoculated intravenously on eight occasions with doses of sodium thiosulphate alone, rising from 0·6 to 4·5 gr., showed no signs of discomfort.

Discussion and Conclusions.

1. Patients subjected to a prolonged course of intravenous injections of antimony frequently exhibit signs of hypersensitivity—presumably an example of drug allergy—with non-toxic doses. 2. It is suggested that the signs of this hypersensitivity may be due to an alteration of protein metabolism and in extreme cases may resemble true protein shock. 3. The viscera of a man who had died from accidental error of dose of intravenous antimony showed degeneration and destruction of parenchyma of liver and kidneys. 4. In a series of four rabbits which succumbed to intravenous injections of antimony tartrate, two of the series died after initial doses of ¼ gr., a third after three doses of ¼, ¼, and ½ gr., and a fourth after nine doses rising from ¼ to ⅝ gr. and totalling 4½ gr. 5. The post-mortem changes noted in these animals were: (*a*) dilatation of blood capillaries, (*b*) effusions into serous membranes (pericardium and peritoneum), (*c*) hæmorrhages into lungs and spleen, and (*d*) retention of urine. 6. The chief histological lesion noted in these animals was degeneration of the hepatic cells. Similar, but less constant and less marked, degenerative changes were found in the kidney tubules. 7. An attempt was made to protect a rabbit against the toxic effects of antimony by injecting sodium thiosulphate shortly after each dose of the antimony. The animal died after receiving 4½ gr. of antimony over a period of 23 days. This compares favourably with the fourth rabbit of the preceding series, which died after 4¼ gr. in 16 days without attempted protection with sodium thiosulphate.

References.—1. Fargher, R. G., and Gray, W. H.: Jour. of Pharmacol. and Exp. Therap., 1921, xviii., 341. 2. Kolmer, J. A.: Infection Immunity and Biologic Therapy: third edition, 1924. 3. Blyth, A., and Wynter, M.: Poisons, fifth edition, 1920. 4. Korns, S. H.: China Med. Jour., 1921, xxxv., 564.

Clinical and Laboratory Notes.

A CASE OF AMŒBIC DYSENTERY CONTRACTED IN ENGLAND.

BY MARTHA N. RUSSELL, M.R.C.S. ENG.,
HOUSE PHYSICIAN, ROYAL FREE HOSPITAL.

THE following case of amœbic dysentery is of particular interest in that the disease was contracted in England.

B. H., aged 38, was admitted to the Royal Free Hospital on Oct. 10th, 1925, complaining of diarrhœa, with bright red blood and mucus in the motions. She had suffered from this complaint for three years, and gave a history of sudden onset while she was engaged in cooking for a large institution in Manchester. When first admitted to the hospital she was having about six stools in 24 hours; these consisted chiefly of mucus and blood, there being very little fæcal matter present. On pathological examination enormous numbers of the cystic and vegetative forms of *Entamœba hystolytica* were found. After three courses of emetine—emetine hydrochloride gr. ½ hypodermically night and morning for three days—at three weekly intervals, the condition completely cleared up.

The pathological evidence and the cure by emetine leave little doubt that this was a case of amœbic dysentery. The interesting points in this case are the facts that the patient herself has never been out of England and that, so far as she knows, none of her associates have suffered from the same complaint.

I am indebted to Dr. W. P. S. Branson for liberty to publish this case.

THE STORY OF A SYRINGOMYELIA.

BY W. S. HEDLEY, M.D. EDIN., M.R.C.S. ENG.
LATE PHYSICIAN IN CHARGE OF ELECTRO-THERAPEUTIC DEPARTMENT, LONDON HOSPITAL.

FOR the last 30 years I have had continuously under observation a case which, on account of its late appearance, its destructive onset, its slow progress, and its already long duration, seems deserving of record.

I first saw the patient, aged 35 years, in 1896. She had been of active habits up to five or six years ago, when she began to feel ill-defined sensations of "tingling" in both arms and shoulders. This disappeared, but shortly afterwards weakness and wasting of the arms became very evident, and advanced rapidly.

On examination the entire musculature of the shoulder-joint was atrophied and showed diminished or lost response to electricity, and in places R.D. The deltoid was powerless, and the triceps could not raise the arm against gravity.

Slight voluntary movement at the elbow was possible (by supinator longus rather than by biceps). Wrist movements weak. Flexion and extension of the fingers remained, but there was paralysis of interossei. A mass of brawny inelastic tissue lay beneath the skin of the scapular region. Tactile sensibility was not much impaired, but there was dullness to painful impressions and, most significant, loss of discrimination between "hot" and "cold," and in places actual reversal of these impressions.

It was fairly evident that the case was one of syringomyelia and that the cervical plexus had, as usual, borne the brunt of its onset. Some weakness in the legs was complained of, but she said that she could (and did) walk three or four miles a day without serious fatigue.

She had not been under treatment in England: but for some years past had visited German baths under local medical advice, and her German doctor, who was at the moment in England, accompanied her at her next visit to me. I told him my views, with which he agreed, and before taking leave he did not fail to impress on me the absolute necessity for a further, and immediate, course of (German) baths! I learned later that before her marriage her husband had taken her to consult Sir William (then Dr.) Gowers, in view of their projected marriage. Sir William Gowers explained to him the nature of the disease (syringomyelia) and told him to "get out of his head" any idea of taking the proposed step. The sequel was "the old, old story,"—they walked out of the consulting-room and thence, almost immediately, into the church.

Since that time the case has presented a steady, but astonishingly slow downward progress. The breathing is shallow, "costal respiration" is hardly perceptible. The diaphragm is acting far below its normal strength, but in forced respiration the sterno-mastoid and trapezius are still acting. Wrist flexion and extension and some pronation are still weakly present, but the claw-like hand ("main-en-griffe") is fully established. There is now very notable loss of power in the legs, and a quarter of an hour's shopping on the arm of a companion is all that she can accomplish. In a sitting position every voluntary movement of the leg can be carried out, although feebly and with effort, but in walking or standing balance is insecure and at times almost impossible. There is exaggerated knee-jerk on the left side, electrical reactions weak; can distinguish "hot" and "cold." The eyes are healthy, but about 20 years ago diplopia was present. Both external recti muscles were affected and the right inferior oblique, but the diplopia was not constant, and eventually disappeared under the use of glasses for near work, to take off the strain on accommodation. No articular troubles.

Treatment.—As the patient's general health has been excellent during the whole period under review, I have relied throughout on the triple agencies of electricity, massage, and movement. Three times yearly for 12 consecutive days the case has undergone this treatment, systematically and laboriously carried out. Uphill work for both patient and practitioner—the latter ever conscious that, successful though his delaying tactics may be, he must ultimately and inevitably prove to be the "player of a losing game."

Medical Societies.

ROYAL SOCIETY OF MEDICINE:
GENERAL MEETING OF FELLOWS.

A GENERAL meeting of Fellows was held on Jan. 25th, with Sir STCLAIR THOMSON, President, in the chair, when Lord DAWSON opened a discussion on

HYPERPIESIS.

He said that it was natural in such a discussion to refer to Sir Clifford Allbutt, the great master who still inspired our thoughts on this subject. He had preferred the term "supertension" to "hypertension," and this term the speaker would use. The choice of "hyperpiesis" was preferable for discussion to that of "hyperpiesia" because the key to the disease and hope of alleviating it lay in the study of its beginnings. Supertension was not a disease, but passed gradually and without any sharp dividing line into certain disease conditions, better considered under their own proper headings.

Association of Supertension with Over-responsive Vasomotor System.

He believed that there was a group of people who had an over-responsive vasomotor system just as others were liable to nervous dyspepsia and diarrhœa; it was part of their make-up. They were liable to transitory supertension under physical or psychical stress, some under the former alone, but the majority under psychic strain, particularly ambition. It might be a family trait. The link between the higher centres and the vasomotor centre was too intimate, so that the latter responded to every disturbance. He took, for example, three apparently healthy, happy school-boys. The first had a pressure of 125/60 recumbent which rose to 162/65 after running up 72 stairs two at a time. This was no more than one would expect from a boy slightly agitated at going to school for the first time, and it returned to the former reading after six minutes' rest. The second boy gave readings of 110/65 and 135/70, but the third had a recumbency pressure of 135/70, which went up to 170/85 after effort and took 20 minutes to return to normal. He was a potential hyperpiesic. What was in store for him depended on his circumstances, how engrained his vasomotor response was, his temperament, whether placid or over-anxious, whether he became a slave to anticipation, his employment, his social life, whether congenial or discordant, his physical habit, and his family tendencies. He might keep within the normal till middle age. Other examples of hyperpiesis were found in a series of 580 Toronto undergraduates, 10 per cent. of whom had a pressure over 140; in Alvarez's series of 1500 undergraduates, 20 per cent. of whom were over 140, and in a series of 650 London school-children, aged 10–17, 8 per cent. of whom were higher than 130. Some of these showed signs of cardiac stress; a little displacement of the apex, an enlargement to X rays, some accentuation of the second aortic sound, and a left-sided preponderance. There was evidence that supertension did exist among the young, and though in many it might be a passing phase it was not so with all. The condition was a reaction to modern civilisation. Dr. Strickland Goodall had found that the most frequent antecedent of a high blood pressure in cases under 40 years of age was scarlatina, but in Lord Dawson's opinion there was too strong a bias in favour of infection and not enough attention was paid to the soil. It was not likely that most of these healthy young people were the victims of infective processes. Frost had investigated some adult subjects of mental stress and anxiety and found a resting pressure of 148 with rise to 220 after effort; the same case examined on another day when the stress was absent gave a perfectly normal reading of 118–144. No individual with normal responsiveness of the vasomotor centre would show such a change in reading. In the next stage of the condition the rest pressure went to a higher level and the patient might complain of headaches or throbbings. The diastolic reading was of the greater importance; if it were not higher than 100 and there was no arterio-sclerosis a moderate systolic rise was not serious. As an example of a fixed supertension in youth he cited a girl of 23 who looked and felt healthy and had no disability save easy fatigue after a full day's work and some breathlessness after heavy exercise, with occasional headaches. She had had scarlet fever. Her resting pressure remained for several years 250/150, going to 280/150 after effort, and a month's careful treatment to reduce the figures only resulted in their return to the original reading after the first ten minutes' walk. Her younger sister had a rest-reading of 160/100. Her heart was slightly enlarged and her radials too palpable. Histologically, her kidney showed a marked pure hypertrophy of the media with early atrophy of the tubules. In some of the smaller vessels there was some hyaline

thickening of the intima and splitting of the elastic tissue and focal deposits of fat, but these changes were slight. Hyperplastic sclerosis was probably not a factor in the early stages of hyperpiesis, though it played an increasing part later. It showed a marked selection for the vessels of the kidney, pancreas, and spleen, and developed in the course of hyperpiesis, which was apt to be followed by clinical arteriosclerosis, although the latter condition was not associated with hyperpiesis in half the cases. The two things might hunt in couples when hyperpiesis had reached a certain stage. Comparing the above early case of hyperpiesis and a case at a later stage, Lord Dawson pointed out that the thickening of the media was marked and the intimal change slight in the early case. At a later stage the thickening of the media was less apparent and the intimal change more apparent. It looked as if at a later stage the muscular tissue of the thick media might be replaced by fibrous tissue. The intimal change, though bearing no necessary causal relationship to hyperpiesis in the initial stages, yet gave the kidney large control in the later stage. The patches of atrophic tubules were due to failing blood-supply and their extension probably went hand in hand with hyperplastic sclerosis. These areas of atrophy and replacement fibrosis might extend with time, reduce the amount of functioning tissue and so lead to more cardiac hypertrophy. They might extend so as to involve glomeruli in such numbers as to produce an ischæmic nephritis—hence, perhaps, the resemblance of certain cases of advanced hyperpiesis to interstitial nephritis. There had been 4 of such out of 23 cases of high blood pressure recently reported by Dr. John Parkinson in his paper on heart failure with normal rhythm. He wished to emphasise that in its beginnings hyperpiesis had a functional origin, although the majority of cases showed themselves in later life associated with eclampsia and with the blubber type of obesity, suggesting warped metabolism. The chemistry of the condition was very difficult and liable to error. Investigation had shown no definite relation between it and the taking of meat, alcohol, or tobacco. It was a condition of over-excitability of the vasoconstrictor centre. In conclusion, said Lord Dawson, what were the beginnings and what were the stages in the evolution of the condition? The origins were several; the anatomical course was the same. Could, and did, hyperpiesis have an origin in exaggerated function—in an excessive vaso-constrictor responsiveness? If so, was hypertrophy of media and heart the earliest change? Or did hyperpiesis take origin in a previous infection? If so, was the next stage thickening and degeneration of the intima? When the condition occurred in middle life was the first stage infection or perverted metabolism? If so, was the resultant hyperpiesis the result first of vaso-constriction or of intimal degeneration? These were important questions from the point of view of early and preventive treatment.

Prof. F. R. FRASER said that the mean arterial pressure depended on the output of the heart and the peripheral resistance. He proposed to deal only with factors influencing the latter. In health it was so regulated by elaborated nervous reflex mechanisms that an adequate supply of blood was maintained to all the tissues. The vasomotor centre in the medulla was of principal importance. An adequate supply to the centre caused a rise of general arterial pressure through constriction of the arterioles, particularly in the splanchnic area. The centre was also stimulated by afferent peripheral stimuli such as those of pain. The higher parts of the cerebrum could also effect general arteriole constriction, as in sudden emotional states and the state of anticipation of sudden exertion. The injection of adrenalin could produce this effect, but to what extent the adrenal bodies were responsible in emotional states was still undecided. Chemical substances in the circulation could also produce a general arterial rise. Constriction of the arterioles and structural changes in the blood increasing the resistance to flow, as in hyperplastic sclerosis or erythrocythæmia, would have a similar effect. In such cases the raised blood pressure was a symptom of the more fundamental disease processes. A solution of the relationships between raised arterial pressure and degenerative changes in the arteries and renal disease would throw light on the whole problem. The possible causes for hyperpiesis appeared to be: (1) Disturbance of the vasomotor centre. (2) Influences at the centre from the higher parts of the brain or the periphery. The therapeutic success of rest cures and of education in hygiene favoured the existence of such a relationship, although it was difficult to see how emotional states could produce a persistent rise of pressure. Possibly there might be some adaptation similar to that of conditioned reflexes. (3) Circulating chemical bodies including internal secretions. This was supported by the number of cases arising about the menopause and those in adolescence that disappeared in adult life, and also by the satisfactory therapeutic results of restricted diet and restricted indulgence in alcohol and tobacco. (4) Unrecognised arterial or renal disease in early stages. It was probable that the persistently raised pressure in the group of cases labelled "hyperpiesis" was the result of a number of causes. In every early case careful note should be made of hereditary factors, constitutional make-up, exposure to mental and physical stresses, over-indulgence or unbalanced dietary, infections, and evidence of disturbances of internal secretion. He pleaded for more extended use of the sphygmomanometer, the diastolic pressure being the better guide to peripheral resistance.

Dr. F. PARKES WEBER denied that hyperpiesia could be an outcome of the stress of modern life. Prof. E. H. Starling had shown that the normal brain needed a well-maintained blood pressure, and that if there were any danger of the blood pressure in the vasomotor centre and brain becoming insufficient, the blood pressure of the whole body would be raised. Some persons who had led a very active life began to react to its stress at the age of about 50 by increasing blood pressure. This, he thought, was because the cerebral circulation became defective owing to changes in the arterioles, and because the nervous centres became blunted in some way and needed a higher blood pressure in order to enable them to perform the work demanded of them. The type of individuals that reacted to the stress of civilised life by increasing their blood pressure, while others remained at the prime of their usefulness, were not the constitutional neurasthenics and psychasthenics, whose safety-valve was their nervous system. Nor were they the chronic dyspeptics and visceroptotics whose gastro-intestinal system reacted to any stress with pain. They were people who have habitually taken more food, with or without excess of alcohol or tobacco, than they should have. They usually belonged to families with a tendency to high blood pressure. They did not reduce their food intake after puberty, but rather increased it. This set up a kind of vicious circle; for too much food produced a toxic condition, which affected the circulation of the brain. The resulting distress caused them to enrich their diet. The hyperpiesia of early life was much graver, for the constitutional factors outweighed all other. To try to produce an artificial low blood pressure by applying X rays to the suprarenal capsules, or by excising part of one of them, was very dangerous. He could not agree with the association of hyperpiesis with a large erythrocyte count.

Dr. J. A. RYLE stated that the predominant factor in high blood pressure conditions was a diathesis. He summarised the results of his analysis of 50 patients whose systolic and diastolic pressures were over 170 and 100 mm. respectively. Sixty-two per cent. were robust and stout; these he called the hypersthenic type. They possessed, as far as their alimentary system was concerned, a hypersthenic diathesis; their chest dimensions were large and the tone of their digestive muscles good. American

observations on students showed that 10 per cent. of this type had hyperchlorhydria. Their output of work and their appetites were large. If they formed habits of excessive eating, working, or worrying their blood pressure would rise. These had rarely seen a doctor before for anything serious, and came when their complaint was still recent. High blood pressure in these was an exaggeration of their physical characteristics. 16 per cent. had poor physique. Their symptoms had appeared early in life, and they had suffered from alimentary trouble, pulmonary tuberculosis, and other chronic diseases. This type of hyperpiesia was entirely different from the hypersthenic type. 4 per cent. were nervous subjects, and their condition had inhibited the tendency. Two other groups were familiar: (1) where the menopause helped the constitutional disposition, (2) youthful cases which were exceptional. He said that we should probably obtain better results from studying the soil on which the condition flourished than by laboratory methods.

Dr. DOROTHY HARE drew attention to the fact that there might be considerable variations in blood pressure readings in any individual under uniform conditions. There might be a difference of 20 mm. in consecutive readings at one sitting. Her figures were drawn from a series of normal pregnant women seen at intervals of about a month. The conditions of examination were kept as uniform as possible, the patients lying down for at least 20 minutes before a reading was taken. The first reading was always discarded and then three consecutive readings taken by the same observers on the same instrument. The two arms were measured simultaneously and might show a difference of 10–20 mm. pressure, the right being higher than the left in 83 per cent.; 31 per cent. of the cases showed variations of more than 10 mm. in consecutive sittings.

Sir JOHN BROADBENT said that it might be taken for granted that some families had a tendency to high blood pressure and some to low. There was no high blood pressure without some degree of peripheral resistance. It was unreasonable to assume that high blood pressure was necessarily due to the nitrogenous excitatives that accompanied kidney trouble, for this was often absent. There must be some common cause. High blood pressure might be responsible for kidney trouble. Even if the vasomotor system were over-excitable there must be some toxin to excite it; adrenalin and thyroid would cause hyperpiesis, but there was no evidence of the hypertrophy of either of these glands in the majority of cases. High blood pressure and renal disease had many symptoms in common, but death in coma and convulsions was very rare in the former. It was impossible to state what the toxic substance was, but we should look less to the kidney for the cause of hyperpiesis and more to deficient metabolism by the liver. The French had given the name "uræmic moiety" to an unknown constituent that combined with excess of nitrogen in uræmia; this moiety might have some bearing on hyperpiesis.

Dr. HENRY ELLIS said that it was important to remember that the two types described differed in chemical composition. The first type—the majority—had always an increase of phosphoric acid in the urine, the ratio of combined ammonia and free phosphoric acid being level, and in these the toxic element could always be ruled out. In the second group the ratio was 3:1, and in all these cases there was a toxic element. If hydrochloric or other acid were administered to the first group the blood pressure rose markedly; in one case six doses of acid raised it from 140 to 250. This was due to a deficiency of the capacity of eliminating acids. High blood pressure in mature people was coördinated with increase of the acid ratio. Usually an intestinal toxæmia could be demonstrated, due to erroneous absorption of amino-acids which were eliminated by the kidneys. The rise of pressure was necessitated by the deficiency of elimination. Once raised it could not easily be altered, for sudden drop again would alter the inter-cellular equilibrium. It would not be possible to differentiate these cases until the urine was systematically examined. It was really a blood condition; possibly the viscosity of the blood was altered.

Dr. J. C. BRAMWELL agreed that the diastolic pressure was very important; a rise in the diastolic pressure raised the mean pressure and made the arterial wall much less distensible, which entailed a rise in the systolic pressure if the heart was to maintain its output. It also limited the oxygen intake of the body; even a great increase in the pulse-rate would only allow of very mild exertion. There was a compensatory modification of the cardiac mechanism, a prolongation of the ejection phase of systole, so that some of the blood discharged into the aorta had time to escape to the periphery before the heart attempted to discharge the rest of its contents. The sphygmograph record was of value in prognosis; so long as the systole was prolonged the muscle must be fairly satisfactory; when the record became more normal in appearance the prognosis was less good.

Dr. HALLS DALLY said that the same term was often used by different writers in a different sense and he was concerned with classification. Hyperpiesis was a rise in arterial pressure from any cause whatever, whether temporary or permanent. Ultimately the problem rested on physics. In physics there were only two causes for increased pressure—increased force and increased load. He suggested dividing hyperpiesis into three: (1) Hyperdynamia, (*a*) primary, in cases which necessitated an augmentation of the driving force of the heart and great vessels; (*b*) secondary, compensatory to (2) hyperachthia, which might be (*a*) primary, an increase in tone and thickening of the vessel walls associated with hypertonia, or (*b*) secondary, an increase of tonic contraction in response to hyperdynamia. (3) Hyperpiesia. This scheme could be adapted to low blood pressure by substituting "hypo" for "hyper." He wished to register a protest against the term "hypertension."

Dr. C. O. HAWTHORNE suggested that the term "blood pressure" should be done away with altogether and the term "sphygmomanometer reading" substituted. The fact was the reading; whether that meant blood pressure or not was still uncertain. He had noticed that the blue hands and chilblains of young women so often seen in out-patients were invariably associated with a high reading. He was quite sure that high readings in early life did not always mean a progressive condition.

Dr. KINGSTON BARTON said that he was obsessed by the idea that all cases of persistent high pressure could be reduced to some disease in the kidney. The prevailing tendency was to treat disease without knowing what health was. It was ridiculous to send cases of high blood pressure away as having "no disease" or "no cause." Fifty per cent. of the post-mortems done in London revealed kidney disease, but the assigned cause of death was "heart failure" or "cerebral hæmorrhage." They were told there was no kidney disease because there was no albuminuria; but the kidney could not be said to be sound before the heart had been X rayed and the blood-urea estimated. Hyperpiesia was a physiological safeguard and patients could not live without it.

SECTION OF EPIDEMIOLOGY AND STATE MEDICINE.

AT a meeting of this Section held on Jan. 22nd, with Dr. E. W. GOODALL in the chair, Prof. E. W. HOPE read a paper on the

Influence of the Universities on the Advancement of Public Health.

He pointed out that in the pioneer work of early nineteenth century hygienists the universities had had no direct share. Revelations at inquiries into the condition of the people, the fear of cholera, and perhaps the publications of the Registrar-General, had excited the interest of educated men. The

citizens of Liverpool had appealed to Huxley for advice, and through his recommendation had obtained a classical report by Burdon-Sanderson and Parkes. Sufficient interest had been excited by the beginning of the '70's of the last century to secure the establishment in several universities of diplomas in State medicine. The first to move had been the University of Dublin, although certain aspects of preventive medicine had been dealt with in the Scottish universities for many years previously. Describing the later developments of university teaching, Prof. Hope emphasised the importance of universities, not only for the training of undergraduate and graduate students but as centres to which all members of the community could look for guidance and special instruction.

The paper was discussed by Sir GEORGE BUCHANAN, Sir WILLIAM MACPHERSON, Dr. MAJOR GREENWOOD, Dr. G. C. TROTTER, and the CHAIRMAN.

MEDICAL SOCIETY OF LONDON.

MANIPULATIVE TREATMENT IN MEDICINE AND SURGERY.

AT a meeting of this Society, held on Jan. 25th, with Sir HOLBURT J. WARING, the President, in the chair, a discussion on Manipulative Treatment in Medicine and Surgery was opened by Mr. W. R. BRISTOW and Mr. R. C. ELMSLIE, whose contributions appear in full on another page.

Discussion.

Dr. H. A. DES VŒUX considered that the opening papers would have given the general practitioner much which would be useful to him, as he had not been taught anything at hospital concerning the cases which required manipulative treatment. The ordinary doctor seemed to be afraid of them. He agreed with Mr. Elmslie when he said there were 12 separate conditions of the knee-joint and that they were often very difficult to diagnose. And there was a medical side to the question of manipulative treatment, mainly in the matter of referred pains. Patients who complained that they had neuritis of a limb, which had been existing for months, or a year, were often found to have stiffness and adhesions but no neuritis, and careful manipulation of the joint would cure the pain in many instances. And in these cases cross-examination would bring to light an injury which had been forgotten. He mentioned some cases of the kind in his experience. He agreed with the openers that the main blame for the present condition of affairs rested with the lack of teaching concerning these cases at the hospital; it was because of this lack that the profession found itself on the defensive to-day on this subject.

Mr. T. H. OPENSHAW endorsed all that Mr. Bristow and Mr. Elmslie had said. If a man with a disability went to a bonesetter for treatment and was made worse by him it was the last thing the patient spoke about, but if he had been to members of the profession and then went to a bonesetter the latter never ceased to talk about it. The first thing the bonesetter did was to approach the people who wrote for the lay press. Some of these irregular practitioners seemed to be really innocent believers in their own ability. The newspaper crusade constituted a terrible handicap to the regular practitioner, as also was the holding of exhibitions on stages in various parts of the country. A case of the kind was that of a girl who 20 years ago came to the speaker with a paralytic hip-joint; her hip was constantly coming out of the joint at awkward times. She was brought to him at the orthopædic department of his hospital, and he put her into a splint and in three months the hip ceased to come out when she did not wish it to. After that he did not see her again. She was later secured by a bonesetter and paraded about the country, he paying her 5*s.* a night for exhibition. She walked on to the stage with her splint, the bonesetter called a doctor out from among the audience to certify that the hip was out, he then threw away the walking apparatus, manipulated the hip, the girl helped him by giving a wrench, the hip went in; she was again examined by the doctor, who announced his finding, and the girl walked off the stage unaided. He believed the demonstration was still proceeding.

Mr. ARTHUR EDMUNDS denied that the general surgeons in large hospitals did not take an interest in bone and joint cases and teach students concerning them. It must be remembered that each surgeon had only a limited number of beds, and many cases which would constitute excellent teaching material could not be accommodated. His teacher, Sir Watson Cheyne, did not omit the teaching of manipulation in bone and joint cases; indeed, it could be said that he was keen on it in the proper kinds of cases.

Dr. W. W. STOCKER said he had seen a well-known bonesetter at work, and if patients of his desired to go to a bonesetter he did not try to dissuade them. But he had never, in a long practice, seen a success achieved by a bonesetter on any of his (the speaker's) patients. He had found that it was of no use to argue with patients on this matter, as they were hypnotised by the press.

Dr. J. P. TRAYLEN spoke of the importance of getting from the patient a history of fairly recent injury, as this would often make clear an apparently obscure and difficult case.

Dr. P. B. SPURGIN said he thought the present difficulty in the matter under discussion was due to the great increase in medical knowledge in the last 20 years. In the old days apparently severe lesions were successfully treated by manipulative means. Nowadays the practitioner was diffident about dealing with such cases; he sought other opinions and relied more on mechanical means of diagnosis. There had been great manipulative surgeons in the profession before the use of X rays.

Mr. J. E. H. ROBERTS said he held strongly that there was now in the profession far too much specialism, though admittedly orthopædic surgeons during the past 20 years had advanced the knowledge of surgery in a way that no other branch had been advanced. He considered that surgical knowledge and practice should be more diffused and used more by the general man. Cases of tuberculosis of joints he thought were more common than was generally suspected, and he described a case which was regarded as an instance of this condition, but old tuberculin caused no reaction, and a history of a past injury having been elicited he successfully treated the case by manipulation. Chronic rheumatoid arthritis he found became worse by rest. He also spoke of the common class of case in which pain in the back had been caused by trauma. One such case was seen by a colleague, who ordered a plaster-of-Paris cast for 18 months, but the patient would not submit to it. The speaker saw her and found a tender spot in the erector spinæ; he gave gas and he manipulated and fully extended the legs, and this cured her. He quoted other cases. On the general question he said there was a great need for these cases to be collected and demonstrated to students as a definite part of their training. There was too much to do in an orthopædic department for this to be carried out there, especially as it was necessary to keep in touch with the cases and to note their progress.

Mr. WHITCHURCH HOWELL agreed that diffusion of knowledge on manipulative methods was necessary. He had two medical friends who had been treated by bonesetters, one of them successfully. Both were attached to famous medical schools in London. One had teno-synovitis of the neck and no skiagram was taken before the manipulation by the bonesetter. The other had sciatica and limped badly; it had been going on for months. This last lady went into a home, where she was manipulated several times by the bonesetter in question, and at the present time she had loss of sensation on the outer side of the foot and it might be necessary to have a toe amputated. One case he had recently seen of congenital dislocation of

the hip had been under treatment in London by a bonesetter for 18 months. Each time the mother talked to the manipulator he assured her it was distinctly improving, and that he would eventually get the hip into the joint. No skiagram was taken. In the last three weeks he had seen another case which was under a bonesetter. It was that of a child aged 3, who was being taken twice weekly to have manipulation for congenital absence of the right radius!

Mr. ST. J. DUDLEY BUXTON said it would be agreed that bonesetters seldom manipulated cases of tubercle, unless they were very inexperienced. If they met with such cases they usually sent them away and charged no fee. The lay press was ranged on the side of the bonesetter, and this was a great handicap to the regular practitioner. But a number of practitioners in the profession seemed to be afraid of carrying out manipulation.

Mr. CECIL ROWNTREE gave an account of a case in which he managed to be present at a reduction on a patient carried out by a bonesetter in a case of a lesion, possibly myositis ossificans, at the level of the transverse process of the second lumbar vertebra. The treatment was successful.

Dr. A. C. JORDAN said these manipulators had gone through a fairly prolonged course of accurate training, and hence were likely to be better at manipulation than the ordinary medical man who had not been so trained. Therefore, in the same way as a medical man, having made his diagnosis, employed the best masseur he could find, he could also, having made his diagnosis, hand over his patient to the skilled manipulator. The remedy seemed to be to create a band of manipulators who could be employed to act under the doctor's orders.

The PRESIDENT agreed that something more might be done in the way of teaching manipulative surgery to the student. Not long ago the question of the revision of the medical curriculum was under consideration by the General Medical Council, whose committee discussed the question in considerable detail. That committee issued a recommendation to the licensing bodies and through them to the schools, that mechano-therapy should be an essential part of the medical student's curriculum, that term being meant to include manipulative surgery. There were general surgeons who took a certain number of dressers, who, during their dressership, had to be taught various branches of surgery. As had been said, the general surgeon could not be an expert teacher in everything, neither could he have cognisance of everything which went on in the case of every patient under his charge. Also, one's beds were too limited to teach the whole subject, and the beds had to be occupied by the more serious cases. A large number of patients coming to the out-patient department could be treated best by manipulative means; they might not be seen by the assistant surgeon or the surgeon. There was a tendency for the younger men in lecturing to choose advanced subjects, and to leave out what might be termed minor surgery. He thought it was an open question whether mechano-therapy should be made a compulsory part of the student's curriculum; the lack of time was the trouble, and he did not think advanced specialism was the true remedy. There was needed, however, some modification in the curriculum which would enable students to be automatically taught a number of the methods at present under discussion. His view was that many practitioners were afraid of boldly treating injuries of joints and their after-results. That was brought forcibly home to him during the war. He agreed with what Mr. Openshaw said in regard to the press. The press dearly loved to get up a "stunt" which was against some statutory body; they said the medical profession was a closed borough, governed by a body known as the General Medical Council, and that they did things they should not do. Therefore they were fair game for the press. Consequently if the press was approached in the proper kind of way it was a very easy matter for the irregular practitioner to get very favourable notices in a considerable part of the press. He was able to say that if one sent a statement to the press containing a true account of matters and it happened to be against the "stunt," the probabilities were all against such communication being published. The regular practitioner was at a disadvantage in this contest because he could not advertise. This matter was going to be very much more under consideration before the present year had finished, and much would be coming along which would need the close attention of the profession and of the medical societies if the medical profession was to remain in its present position.

Reply.

Mr. BRISTOW reminded the meeting that this was not a discussion on specialism; his main wish was that the student and practitioner should be taught these things. He was not sure that "mechano-therapy" was a happy term to indicate to the generality of people that manipulative methods were meant. He dissented strongly from the view expressed by Dr. Jordan.

Mr. ELMSLIE said people had come to him with the remark that they were not sure whether they had approached the right person, whether they ought not to have gone to a bonesetter. Many did not realise that the qualified surgeon carried out manipulations. That was largely attributable to the attitude taken up by the press. During the last discussion on this subject in *The Times* very opprobrious remarks were made by Mr. G. Bernard Shaw against the masseur profession, and a short letter was sent to that journal from the Registered Society of Medical Masseurs, signed on behalf of the medical members by Sir Cooper Perry, explaining the position and training of members of that body, but it was not inserted. He concluded with a few words in justification of specialism in surgery.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.

AT a meeting of this Society held on Jan. 21st, Colonel S. P. JAMES being in the chair, Dr. JAMES HASSON read a paper on a

New Method of Diagnosis and Vaccine Treatment of Leprosy.

He said that the present methods of treating leprosy were far from satisfactory in many instances. The results of chaulmoogra oil, hydnocarpate, the morrhuates, and amino-arseno-phenol were contradictory. This was partly due to the metamorphic possibilities of the objective symptoms of leprosy, the variance of which was probably accounted for by the varying degree of intoxication of the patients. No leprologist could boast of having witnessed true cures with any form of therapy. He had therefore investigated a vaccine method, using a stock autolysate containing 15,000 million of *B. pyocyaneus* and about 5000 million of Hansen's bacillus to 2 c.cm. of physiological saline. Leprous patients had blisters induced on them with carbonic acid snow; these were emptied 24–36 hours later, and the sera of different forms, nodular, anæsthetic, and mixed, were incubated together at 36° C. for a period of from 50 days to three months. A mixed culture of *B. pyocyaneus* was then added to the serum (previously rendered incoagulable by the addition of a sterile solution of 2·5 per cent. sodium citrate), and the whole was centrifuged for 20 minutes. The requisite quantity of distilled water was then added, the bacilli counted, and the solution put up in 2 c.cm. ampoules. A symptom of very great value in early diagnosis was a subnormal temperature of 1° or 2°. It was because of this temperature that the bacilli were incubated at 36° C. only.

The method of Row, of Calcutta, using three months' old Koch's bacillus, differed only in his use of non-specific simple unmixed autolysate, and was undoubtedly sound. The action of both vaccines was explained by the formation, in the liquid of the

vaccine, of antibodies excreted by the bacilli themselves. Besredka, of the Institut Pasteur de Paris, had shown that infected wounds cleared up rapidly when filtrates of old cultures of the causative organism were used therapeutically, even in cases where fresh vaccines had failed. Besredka had used specific filtrates only, but the virtue of Row's non-specific method in leprosy was easily accounted for by the close relation between *B. tuberculosis* and *B. lepræ*. The *B. pyocyaneus* was included in order to induce an increase of temperature capable of "dislodging" the bacilli. Injections might be given intravenously or subcutaneously. Intravenous injection produced a violent reaction in one or two hours with shivering and rise of temperature up to 104° or 105° F. Twenty-four hours later the patient would be quite well. After subcutaneous injection the temperature rose only a degree or two. After the third dose the nodules rapidly flattened and dispersed, while the achromic and anæsthetic patches became smaller and disappeared in 2–4 months. There had been no case of relapse after 18 months, and one case of maculo-anæsthetic leprosy treated 14 months ago remained clinically and practically cured, the examination of excised tissue, the Klinger-Hertzfeld reaction with Joltrain's antigen, and the Bordet-Gengou reaction all being negative.

Dr. Hasson demonstrated a case of Dr. Manson-Bahr's with an anæsthetic patch about 2 × 4 cm. above the right knee. A section of excised tissue and scrapings of the nasal mucosa showed no bacilli, but blister fluid revealed their presence in abundance. The blister was raised by carbonic acid snow produced in a simple wooden mould devised by Dr. Hasson and called a "cryocanthere." Vaccine treatment had reduced the anæsthetic area to 1 sq. cm. and hairs were beginning to grow on it.

Dr. P. H. MANSON-BAHR said that his experience with the classical method of treating leprosy had been most disappointing and had impressed him with the absolute failure of the chaulmoogra oil preparations. He had recently examined an undoubted case of leprosy treated by Dr. Hasson's method and had been unable to find any trace whatever of leprosy save slight thickening of the ulnar nerves.

Lieut.-Colonel W. P. MACARTHUR then delivered an address on

Old Time Plague in Britain.

After discussing the varieties of fleas responsible for carrying plague, he pointed out that the disease was dangerous to the insect as well as to man; its œsophagus got choked with a plug of bacilli which it injected into the blood of the host. About 70° F. was the optimum temperature, so that the disease was most rife in England in a dry, hot summer. Plague was never spread from man to man, as the quantity of bacilli in the blood was very small; the culture had to be incubated in the flea. If the Black Death had been contagious it would not have taken a year and a half to spread over England. The plague of Justinian in 543 was the earliest epidemic that invaded this country. It was not found mentioned in English records, but appeared in Irish and continental documents, in the latter of which it was called the "groin disease." In 664 appeared another outbreak, described in Irish records as bubonic. These attacks recurred continually throughout the Middle Ages, and were generally ascribed to famine. In the fourteenth century came the "Black Death," a name that was not used until more than 200 years later. The contemporary term was the "botch," a word corresponding to "boss" or bubo, which was a favourite term of abuse in the time of Knox, long before its modern equivalent "Boche" was made familiar. This epidemic spread westwards from Asia, entering England at Weymouth in August, 1348, and thence sweeping over the country. Scotland escaped in the main and seized the opportunity to mass for an attack on England, but the army met the plague near the Border and 5000 died. A special prayer for protection against the plague of England still found in the Army service dated from this experience. There were no exact mortality figures of 1350, but from one-half to two-thirds of the people died. Judging from tithe records there were about 24,000 inhabitants of Norwich before the Black Death, and only 7000 after it. Three archbishops died within the year. Yet still hope was found to triumph over experience, as one lady was recorded to have buried three husbands in three months! Most of the information was obtained from clerical records, and from these we learned that in East Anglia alone 800 parishes were left without incumbents, 80 of them twice, and 10 of them three times. The Black Death was without exception the greatest calamity that had fallen on the human race within historic times; it broke up the feudal system and altered the course of history. The confusion and chaos were like a great gulf breaking the continuity of history and tradition. The pestilence smouldered for 300 years after the chief outbreak. In May, 1449, Parliament adjourned to Winchester, a little later to Ludgate, then to Leicester and Reading, and finally closed down. Epidemics occurred in 1500, 1509, 1513, 1531, 1542, and 1547. In 1531 the Bills of Mortality first appeared; the Lord Mayor was ordered to report weekly the number of deaths due to the plague. The first Plague Order of which the text survives in extenso dates from 1542, when all plague houses were ordered to be closed and marked with a blue cross and the words "Lord Have Mercy On Us." Should any of the inhabitants of such houses receive special permission to go abroad they were to carry white wands 2 feet long. All dogs were to be destroyed except watch-dogs; there was a strong idea that dogs and cats helped to spread infection. The sanitary conditions of the time were ideal for plague. The floors were of loam spread with rushes amongst which were cast bones, beer, vomit, and excrement, none of which were ever removed; they were merely covered with more rushes. The houses were crowded and ill-ventilated, and the streets full of garbage and excrement. Rats ran everywhere and fleas were regarded as of no more significance than the clothes of the bed. The poet John Donne once observed a flea spring from his lady to himself, and touched by the bond of union thus set up went home and wrote a sonnet about it, ending up with the line—

"And in the flea our two bloods mingled be."

In 1553 2000 persons died of the plague in London in one week. Stratford-on-Avon suffered badly, but Shakespeare's family escaped, and his father subscribed liberally to the relief fund. The first mention of John Shakespeare was his appearance before the court for having outside his door an accumulation of filth that offended even the sensitive noses of his neighbours. Shakespeare suffered many things from the plague, for all theatres were closed whenever the deaths totalled more than 30 per week. In 1603 Shakespeare's company produced four plays at Hampton Court Palace since the theatres were closed for so long a time in London, and James I. subscribed £30 for the relief of the distressed members of the company. In this year the crosses on the doors and the wands were changed from blue to red, but this had no marked effect in checking the plague. In 1625 occurred an epidemic—wherein 4000 died in London in one week—which was known as the "Great Plague" until that of 1665 effaced it. In the latter year 70,000 were recorded as having perished, and this was undoubtedly an understatement, as every effort was made to conceal the true cause of death in order to avoid the restrictions. Deaths ascribed to "malaria" in this year reached the unlikely figure of 5000. There were many concealed deaths from plague in the parish of St. Giles-in-the-Fields in 1664, and the disease was endemic in the squalid, overcrowded, filthy "liberties" outside the city walls. By the end of August, 1665, the usual flight had set in. The Lord Mayor and Aldermen and the stout-hearted Duke of Albemarle remained at their posts and stringent quarantine was enforced. The unfortunate people shut up for a month in infected houses were

often robbed and sometimes murdered by the watchmen set to guard them. Eventually the quarantine orders broke down because there were too many houses to guard, and over 1000 corpses were collected by the watch-carts every night. Cats, dogs, swine, and rabbits were forbidden in the city and thousands were killed. It was thought that they absorbed effluvia from the dead bodies and carried infection in their fur. There was much dispute as to whether fires in the street were efficacious or not, and if so whether they should be of coal or of wood, and which variety of wood most possessed the mysterious anti-plague properties. Finally rain fell and put the fires out, and the Lord Mayor sensibly refused to have them lit again. For 17 years after this plague deaths were recorded, and the real reason for its final disappearance was the development of a sanitary conscience among the people, producing an environment unfavourable to plague, which is essentially a disease of filth and overcrowding. All scavenging and sanitary measures were put under a central authority. The Fire of 1666 helped indirectly because the Rebuilding Act, hoping to prevent another such conflagration, forbade lath-and-plaster houses, and so sealed the doom of *Mus rattus*. Driven from the shelter of houses it encountered the rigours of the climate and, finally, the competition of *Mus norwegicus*, though this species did not become common till 40 years after endemic plague had disappeared in England. Thus the great European plagues of the eighteenth century left this country untouched.

LEEDS AND WEST RIDING MEDICO-CHIRURGICAL SOCIETY.

A MEETING of this Society was held at the Leeds General Infirmary on Jan. 15th at which Mr. A. L. WHITEHEAD occupied the chair.

Dr. W. MACADAM read a paper on the uses and limitations of

Tests of Function in Medical and Surgical Practice.

Lengthy, elaborate, and complex procedures, he said, are out of place in clinical medicine. The various tests of function are of little value if considered alone; they must always be viewed in relation to the clinical condition of the patient. Nor must inadequate function of an organ be regarded as necessarily synonymous with disease. A study of the amount of urea retention in the blood in conjunction with a comparison of the percentage of urea excreted in the urine is the simplest and safest guide to the state of renal function. But a high blood-urea is found in many conditions other than kidney disease. Even a high blood-urea plus albuminuria is not sufficient for diagnosis. Tests of hepatic function have so far not yielded the reliable results given by renal tests, and from the medical point of view they are disappointing. The most useful is the lævulose test; the value of such dye tests as phenoltetrachlorphthalein is still uncertain. van den Bergh's test, although not of much practical value in clinical differentiation of the various types of jaundice, is proving useful in detecting early or latent jaundice, and in distinguishing between hæmolytic and secondary anæmias. Dr. MacAdam emphasised the failure of basal metabolic rate as a diagnostic adjunct in those doubtful early cases of hyperthyroidism in which the clinician also is uncertain. As a measure of the efficacy of various lines of treatment and as a guide to the best time for operation the basal metabolic rate is, however, of distinct value.

Clinical Demonstration.

Mr. P. J. MOIR showed two cases of hydronephrosis illustrating the usefulness of pyelography as a method of diagnosis and examination.

Dr. R. C. WALKER (for Dr. WARDROP GRIFFITH) demonstrated a case of thoracic aneurysm occurring in a man of 33 years. On admission to hospital there was a well-marked pulsating swelling of the chest, which subsided with rest and iodides. Dr. Walker expressed the opinion that the signs on admission left room for no doubt that the condition was one of aneurysm; but there was no history of syphilis, and the Wassermann was negative.—Dr. CURTIS BAIN (Harrogate) and Dr. R. A. VEALE both indicated that they were not convinced, and expressed the opinion that dilatation of the aorta due to aortic disease, probably rheumatic in origin, was a likely alternative.

Dr. C. W. VINING, in association with Mr. J. F. DOBSON, showed a child of 4 years upon whom the operation of thoracoplasty had recently been done for unilateral fibrosis and bronchiectasis following empyema at the age of 11 months. Parts of the sixth to the eleventh ribs had been removed, and Mr. Dobson believed that it would probably be necessary to remove two or three more before efficient collapse of the base of the lung was attained. Following the operation there had been an immediate decrease in the quantity of sputum.

Dr. VINING also showed a boy of 10 years with a three years' history of vomiting believed to be functional. No organic or toxic cause had been found to explain the condition, and the X ray examination demonstrated no obstruction, organic or spasmodic. A month previously the boy's condition was critical, the emaciation being extreme; he weighed only 27 lb. Following the passage of a stomach-tube the vomiting had completely ceased, and his weight was now 41 lb.

Cases were also shown by Dr. J. LE FLEMING BURROW, Mr. L. R. BRAITHWAITE, and Dr. W. H. ROWDEN.

ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.

Insanity from the Point of View of the General Practitioner.

THIS Society met on two recent occasions to discuss this subject. Prof. ARCHIBALD YOUNG, the President, and Dr. W. A. PRIDE took the chair on the first and second evenings respectively.

Dr. R. O. ADAMSON said that insanity was to be regarded as a symptom and studied as such. It was in no way different from other symptoms dealt with by the general practitioner, and it should be approached along the familiar road of careful clinical investigation. The distinction between sanity and insanity was an arbitrary one, but it was important to distinguish what insanity was *not*. It was not a minor psychosis, a neurosis, or a hysteria. In family practice, he said, it was important to take advantage of every opportunity to study early cases and to treat cases, as far as possible, before certification.

Dr. J. H. MACDONALD, speaking from the point of view of an asylum physician, made a plea for earlier diagnosis of insanity and earlier removal of the patient to an asylum. Any disease was, of course, more amenable to treatment in its early stages, but it was particularly difficult to make contact with mental patients after morbid habits of thought and action had been established. Many cases of incipient insanity could be definitely checked and the onset of secondary symptoms prevented by appropriate treatment in the early stages. Not only from the individual but also from the sociological point of view the subject was of the utmost importance. Of 18,398 insane in Scotland, only 3014 were maintained by their relations and the remainder cost the State about £700,000 a year. The observation wards in the parish hospitals had proved of great service and the stigma of being "on the parish" might disappear under new health administration. Observation wards in a general hospital were not suitable, though more use might be made of out-patients' clinics similar to those already attached to some of the general hospitals. Properly organised asylums were probably the best

means of dealing with the problem, but the public must be educated to regard them as "hospitals for mental disease," into which anyone, whether able to pay for maintenance and treatment or not, could be admitted as a voluntary patient. Social considerations were a powerful factor in influencing a decision against certification. Dr. Macdonald concluded by referring to the necessity for after-care to prevent relapses, and to some of the difficulties arising out of certification.

MR. JOHN DRUMMOND STRATHERN, Procurator-Fiscal for Glasgow and the lower ward of Lanarkshire, discussed insanity as it affected criminal responsibility. There were two distinct classes of case in which acute difficulties arose: (1) cases of murder or grave crime in which a plea of insanity in bar of trial was raised; (2) cases of minor crime in which accused persons were usually certified under Section 15 of the Lunacy Act, 1862. It was frequently found that individuals of the first class had previously led a normal life and had shown no indication whatever of insanity. Such a prisoner might be examined by different medical men not unfamiliar with questions of lunacy—for example, by the divisional police surgeon soon after the crime, by the prison surgeon, and by mental specialists for the Crown—without any trace of insanity being found. Notwithstanding this, at a later stage mental specialists instructed by the defence would probably reach quite a contrary conclusion. This was an unsatisfactory state of affairs, and it was not easy to explain the reason for the conflict of opinion. The law was quite plain. An individual is responsible for his act unless he can show—the onus is upon the accused—that he was unable by reason of mental disease to know the nature and quality of his act, or, if he did know it, that he did not know that he was doing what was wrong. An insane person is held not to be responsible for a criminal act upon the ground that, by reason of his state of mind, he is incapable of formulating an intention to commit the crime. A criminal intention is essential in all acts of crime. Not only, said Mr. Strathern, was there complete conflict in medical opinion as to what constituted medical unsoundness in such cases, but very frequently there was actual disagreement among the medical specialists on the facts elicited by examination. Such a state of affairs was not creditable to the medical profession, and greater unanimity should be secured if possible. In his opinion the confusion arose from the failure of medical examiners to understand exactly what the law requires in order to establish a plea of insanity. One body of medical men appeared to be applying the legal definition of insanity, whereas those opposed to them were applying varying standards of their own and regarded a criminal lunatic rather as they would a private patient.

Many accused persons of the second class, continued Mr. Strathern, suffered from temporary insanity or insanity of a mild type from which they would probably recover; but many, on the other hand, were hall-marked criminals and dangerous to the lieges—in short, criminal lunatics and potential murderers, who should be kept under strict supervision permanently or at least for a prolonged period. Such persons might be certified and confined to an asylum, but they were often out again in a very few months by simply escaping from the asylum or by obtaining their release under a certification of soundness by the asylum physician. It was not long before their offence was repeated and they were again certified and confined to an asylum, only again to achieve their liberty by the same process. There was very marked contrast between the methods followed by the medical profession in dealing with those two classes of case. In his opinion society was entitled to be protected against lunatics of the latter class. Once crime was added to lunacy, the point of view of public interest should be paramount and the sentimental interest of the patient and his family should become subservient.

PROF. JOHN GLAISTER said that there was comparatively little risk in certifying mental patients provided that the duty was exercised bona fide and with reasonable care. But a patient in whom there was some departure from normal mental health might be dealt with in another way, as long as the amount of departure did not bring him within the limits of certifiability. In Scotland such a person might be placed in a private, unregistered place, as a home, under a certificate given by a medical practitioner, under Section 13 of the Lunacy (Scotland) Act, 1886, for a period not exceeding six months. To the subject of criminal responsibility Prof. Glaister attached great importance, especially in view of the increasing frequency of pleas of insanity by persons accused of heinous crimes. The presumption of the law was that every person who had arrived at the age of discretion was sane and was accountable for his actions unless the contrary was proved. The person setting up a defence of insanity was required to prove not merely some taint of insanity, but the particular and appropriate kind recognised by the law.

DR. IVY MCKENZIE deprecated the present tendency to establish irresponsibility on what is known as modern psychological theory. It was no doubt important from the legal point of view to establish a defence, but in so doing the interests of society must not be sacrificed. Whilst admitting the desirability of recognising the various clinical types and grades of insanity, he thought that the application of the various technical terms and designations as well as the employment of vague and indefinite phraseology might, and did, prove confusing in the problem of criminal responsibility. Where, in his own practice, there was a question of plea at bar of trial, he was not guided exclusively by the legal precepts as laid down by the various authorities. His method of approach in any particular case was to consider, first, whether the symptoms presented conformed to any well-recognised syndrome, and secondly, whether the patient would have been a suitable case for admission to an asylum supposing no crime had ever been committed. Where criminals were committed to prison under Section 15 the responsibility of the doctor was even greater. About these cases, Dr. McKenzie agreed with the Procurator-Fiscal's point of view, and considered that quite a different standard was required from that governing the first type of case. Here there was an individual who repeatedly committed crimes, such as assault and indecency, on whom punishment had no deterrent effect. Such cases should be classified as insane and certified as such. The feeble-minded person could never be a criminal by reason of defect, but by something that he did—some positive harmful act—and the question here should be: Was the actual conduct prejudicial to society? The average defective was a very harmless person, but when he acquired vicious habits he might become dangerous and should then be classified as insane and dealt with accordingly.

DR. D. K. HENDERSON considered that the whole question of mental disorder and defect—of crime, delinquency, and unemployment—was a problem which had as its unit individuals who, for one reason or another, had been unable to meet the stress and strain of ordinary social life. To deal with this radically an attempt should be made to get at the potentially disordered individual at an earlier stage. We must begin in the nursery and we must pay special attention to the school period. Children's teeth and eyes were carefully examined and looked after; there were special classes for cases of mental defect; but was sufficient attention paid to the "problem" child, sensitive and nervous, asocial and a dreamer? The general practitioner should always keep in mind the psychological aspects of (even physical) illness, and all such symptoms as tantrums, sleeplessness, irregularity of appetite, and nocturnal enuresis should be treated with great seriousness. The practitioner could also help by urging the value of treatment in a mental hospital, minimising as much as possible the stigma of certification. He thought that in the past asylum

superintendents had not taken up a sufficiently definite attitude towards the problem of the mental health of the community. Turning to the medico-legal side, Dr. Henderson said that he believed law and medicine to be two different subjects altogether; he did not see how they could ever see eye to eye. The law dealt with the crime, whilst medicine dealt with the criminal. The law was therefore, to a certain extent, partisan, whereas medicine and medical opinion should be unbiased. Furthermore, it was constantly said that the plea of insanity in criminal cases was now completely overdone, whereas, in his opinion, quite the opposite was true. Mental disorder in relation to crime was not fully enough considered, and there were far more insane people convicted and sent to prison than there were sane people who escaped the rigour of the law on the plea of insanity. Dr. Henderson quoted statistics which made him certain that our prisons to-day were loaded with individuals in many respects not responsible, though he agreed that in major crime insanity was far too frequently pleaded.

Dr. MARION GILCHRIST thought that some provision should be made for senile dementia other than asylum care. She agreed with Mr. Strathern and Dr. McKenzie that, where homicidal persons were concerned, it was much more important to look after the interests of the sane than of the insane and that the sane should be protected from homicidal maniacs. Especially she thanked Mr. Strathern for his comments on the punishment of offenders against women and children. It was a disgrace to our civilisation that these men should be allowed to be in and out of prison, or in and out of asylums as at present, and it should be quite possible to detain them for life.

ABERDEEN MEDICO-CHIRURGICAL SOCIETY.

A MEETING of this Society was held on Jan. 14th, when Dr. J. F. CHRISTIE, Vice-President, took the chair, and Dr. J. ROSS MCKENZIE read a paper on some advantages of

Gas and Oxygen Anæsthesia in Major Surgery.

The technique of surgical operations, he said, had now reached a very high standard, but a number of early post-operative deaths were still unaccounted for. After describing a new apparatus embodying a triple sight feed for the administration of nitrous oxide, oxygen, and carbon dioxide, with or without ether, from which any combination and percentage of the gases could be obtained at will, he enumerated the operative advantages of gas and oxygen anæsthesia under the following headings: Ease of inhalation and induction, safety of patient, blood and circulatory apparatus unaffected, anoxæmia absent with normal metabolism, rebreathing with conservation of patient's own carbon dioxide, and de-etherisation with rapid recovery. Ether could be eliminated by making the patient rebreathe his expired carbon dioxide and by supplying this gas through the apparatus. Post-operative advantages included marked relief to the patient from nausea, sickness, and gastro-intestinal distension; normal functions of all the organs throughout the period of anæsthesia; and notable absence of chest complications. Dr. McKenzie put forward the suggestion that this form of anæsthesia acted as a protective against post-operative thrombosis and embolism. Surgical shock, he believes, is due more to a toxic anæsthetic, lack of oxygen, and loss of carbon dioxide, than to operative trauma and loss of blood. The difficulty experienced in inducing anæsthesia with gas and oxygen in young children could be overcome by using a face-piece with a graduated expiration valve attached directly to the gas bag.

Dr. A. OGSTON, Mr. A. MITCHELL, and Mr. W. ANDERSON were amongst those who took part in the discussion.

LIVERPOOL MEDICAL INSTITUTION.

AT a meeting of this Institution on Jan. 14th Dr. DINGWALL FORDYCE read a short paper on

Epilepsies in Childhood.

He first referred to the difficulties of early diagnosis of epilepsy when the manifestations were those of incomplete forms such as visceral spasms. An epileptiform attack having occurred, the cause (apart from diabetes or uræmia) might be: (1) A gross intracranial abnormality such as birth trauma, infantile cerebral paralysis, or some form of amentia. Or (2) the attack might occur as a symptom of, or in conjunction with, primary amentia unassociated with gross intracranial abnormality. It was most important for prognosis to recognise whether or no amentia was present apart from the fits. He had recently had in review 129 children of school age, reported as being sufferers from epilepsy. In 35 of them there was evidence of an organic cause or of primary amentia (i.e., 18 cases of primary amentia, 10 of infantile cerebral paralysis, and 7 of birth trauma). The significance of such differentiation was shown by the figures for imbeciles. Of the 129 children, 32 were noted as imbeciles or probable imbeciles, and of these 16 were cases of idiopathic epilepsy, 9 of primary amentia, 4 of infantile cerebral paralysis, and 3 of birth trauma. In other words, half the imbeciles or probable imbeciles came from the group of 94 cases of idiopathic epilepsy and half from the group of 35 with organic lesions of the brain or primary amentia. Lastly (3) there might be no evidence of gross organic abnormality or of primary amentia. In this group were to be placed cases of (*a*) spasmophilia, (*b*) infantile eclampsia, (*c*) occasional fit or fits, (*d*) pyknolepsy, and (*e*) characteristic idiopathic epilepsy. In all the types of case in this group the presence or absence of an essential or idiopathic epilepsy might be conjectural, for a time at least.

MANCHESTER ROYAL EYE HOSPITAL.—At the annual meeting, which completes the 110th year of the hospital's activities, it was stated that the number of out-patients treated was 32,243, and of in-patients 2138. The average length of stay of in-patients in the hospital was 18·9 days, and the number of accidents treated was 8425, an average of 23·1 per day. The hospital serves an area embracing the greater part of Cheshire, all Lancashire, and beyond as far north as Carlisle, as well as the West Riding. A legacy of £10,000 is to be devoted to the new out-patient department. In spite of a rise in the ordinary income, it was found necessary to draw to the extent of £1200 on the hospital's accumulated fund.

PUBLIC HEALTH PROGRESS IN MANCHESTER.—Dr. R. Veitch Clark, medical officer of health for the city, has recently given some striking figures illustrating the marked improvement of public health in Manchester in the last generation. Public health is concerned primarily with the abolition of illness rather than with the reduction of death-rates. Among children under 5 the death-rate in 1911 was 56, and in 1922 it was 39, an improvement of 30 per cent. in ten years. Among children from 5 to 10 in the same period the death-rate fell from 3·9 to 2·9, a reduction of 25 per cent. The improvement among children from 10 to 15 years old was 27 per cent. The percentage of deaths below 5 years in 1904 was 43 per cent., in 1924 it was 24 per cent. The true index of the efficiency of preventive medicine is the increase of health and personal efficiency. About 1850 every boy at birth had an expectation of life of 39·9 years and every girl one of 41·8 years. In 1922 the expectation of a boy had risen to 54·6 years and of a girl to 58·6. At the age of 7 a child had attained more than half the height of an adult and one-third the adult weight. To make up the other half of its physical development it took 18 or 19 years. This put an undue strain on the body cells, and it is the object of preventive medicine to reduce this strain. In Manchester about 40 per cent. of the mortality occurred at the age of 25 or earlier. The conclusion to be drawn is that disease should be attacked within this period, when its influence, because of its effect upon development, was most malign. Health in childhood and youth meant efficiency in manhood.

Reviews and Notices of Books.

PRACTICAL PHYSIOLOGY.

Second edition. By E. P. CATHCART, M.D., D.Sc., F.R.S., D. NOËL PATON, M.D., LL.D., F.R.S., and M. S. PEMBREY, M.A., M.D., F.R.S. London: Edward Arnold and Co. 1925. Pp. 409. 18*s*.

THIS book is now divided into three parts, the first being devoted to experimental physiology, the second to physiological histology (a subject not formerly dealt with), and the third to chemical physiology. Among the many excellent features of the revised elementary experimental course are the important training in observation and deduction which it gives, and the large preponderance of experiments on the human subject. The authors point out that "the problem to be investigated and the methods of investigation are indicated . . . . but the results to be obtained and the conclusions to be drawn are left to the student." In the advanced course animal work naturally takes a more prominent position, but even here its application to man is never lost sight of, and whenever possible the human subject is used as the experimental animal. This part is profusely illustrated with good experimental tracings, which serve not only as a source of information to the student, but also as an encouragement to him to produce the neatest work which his limited experience in experimental technique will allow. Those tracings showing the attainment of the "steady state" in human and in frog's muscle, and the rapid exhaustion which ensues in the latter when the circulation is arrested, are especially fine. In Part II. the functions of living cells are studied as far as is possible by means of the microscope. Physiological histology, however, cannot confine itself entirely to the study of living tissues, but must include the preparation and study of tissues no longer alive. And just as the study of gross anatomy has preceded the study of physiology, so very frequently the study of minute anatomy must precede observations during life. These reasons are given for including in this course, not merely the methods of studying the living structures, but also the methods of preparing and studying these structures after death. Part III. contains an elementary course in chemical physiology, which follows the usual lines of an advanced course. The latter is to a large extent concerned with quantitative methods, and includes a description of the Douglas bag method for the determination of the basal metabolic rate.

The authors have been successful in condensing into small compass the experimental study of a wide physiological field.

THE MENTAL GROWTH OF THE PRE-SCHOOL CHILD.

A Psychological Outline of Normal Development from Birth to the Sixth Year, including a System of Developmental Diagnosis. By ARNOLD GESELL, Ph.D., M.D., Professor of Child Hygiene, Director of Yale Psycho-Clinic, Yale University. New York: The Macmillan Company. 1925. Pp. 447. 15*s*.

THE main interest of this book consists as much in what it foreshadows as in what it actually achieves, though the extent of its achievement must not be under-estimated. Hitherto students of the psychology of the young child have confined themselves to careful observation day by day and month by month of individual children in their spontaneous activities. In this connexion the work of Pestalozzi, Perez, Froebel, Preyer, Sully (to mention only a few) has still much more than historical interest. But it was inevitable that the methods of estimating the average intelligence and achievement that have been applied to the school child by Binet and his successors should be extended to younger children and even to infants. This book contains an account of the work done on modern scientific lines at the Yale Psycho-Clinic under Dr. Gesell's direction, by observation and experiment upon normal children, with a view to determining the normal course of development of the child. Necessarily a considerable extension of the idea of what constitutes a "test" has been required. Some of these "tests" are really only accurate observations of a child's spontaneous movements and reactions to stimuli and of his physiological development; others are definitely tests, but more practical than linguistic. The results of the study of several hundred children are presented as cross sections of the stages of development reached at ten ages, ranging from 4 months to 5 years. The method of applying each test or "item," as the author prefers to name it, is fully described, and the comprehensiveness of the inquiry may be gauged by the large number—144—of "items" included. They are grouped under the headings of Motor, Language, Adaptive Behaviour, and Personal Social Behaviour. Very few of even a young baby's normal activities have been omitted, but it is doubtful if it is wise to accept a mother's statement regarding any particular action where the examiner has himself failed to observe or to elicit the action, the mother being scarcely ever an unbiased observer.

Those who practise mental tests of low-grade subnormal children will be grateful for the additional material put into their hands by this book; it supplements very usefully the weakness of most existing scales for the lower mental ages. It may become possible, after further standardisation of some of these tests on larger numbers of children, to arrive at intelligence quotients of some reliability for very young children. Premature grading is, of course, to be deprecated, but mental tests have tended to dispel the old notion that "late development" is anything more than a rarity. Included in the volume are some interesting studies of twins, showing remarkable correspondence of results, even in small details. Precocity and retardation are also discussed, with illustrative cases.

The book can be commended to the attention not only of medical officers who have to estimate retarded children, but also to the practitioner. He will find here means of attaining a truer estimate of a child's stage of development than he is frequently able to do when pressed by anxious parents for prophetic opinion.

PSYCHO-PATHOLOGY.

An Introduction to Objective Psychopathology. By G. V. HAMILTON, M.D., Director of Psychobiological Research, Bureau of Social Hygiene, New York City. London: Henry Kimpton. 1925. Pp. 354. 21*s*.

ONE way of meeting the problem of the relation of body and mind is to exclude mind from our consideration and express human behaviour in mechanistic terms. Dr. Hamilton has made experimental studies of animal behaviour, has isolated certain reactive tendencies common to human and infra-human species, and then in a study of 200 nervous patients has used this classification to explain the behaviour of the patients and help in their treatment. In his therapy he employs methods which are now becoming established among psychopathologists, and the reader unfamiliar with these methods will find in the case-histories a useful introduction to practical treatment. The novelty of the author's presentation lies in the use of terms derived from his animal experiments, and we find such case-headings as "Persistent, Non-adjustive, Affective Reaction to Unsatisfied Major Cravings." But the striving for objectivity seems to fall short of its aim; "sexual-romantic cravings," for example, can scarcely be conceived in terms of animal behaviour or in any terms that exclude the consideration of mental processes. The demand that psychopathologists should exclude whatever cannot be verified by recognised methods of the natural sciences might be applied to exclude the speculative statement, concerning habit formation in the chick, that "synaptic connexions are made in its nervous system for a positive feeding-reaction to the object."

The clinical value of objective psychopathology is not clear, especially when we read, at the end of Chapter II., of a patient receiving a ten-page dissertation on psycho-analysis, which must surely leave him guessing as to the difference between the two theories. The author concludes with a denunciation of the "Freudian thesis"—frequently repudiated by Freud—that "sexual desire is, generically, the original source of all human action." The book contains many practical and original observations, but it is difficult to regard the author's theories as more than an ingenious attempt to evade a problem.

THE HEALING GODS OF ANCIENT CIVILIZATIONS.

By WALTER ADDISON JAYNE, M.D., Emeritus Professor of Gynæcology and Abdominal Surgery, University of Colorado. New Haven: Yale University Press; London: Humphrey Milford, Oxford University Press. 1925. Pp. 569. 23*s*.

THE book before us is the second work published by the Yale University Press on the Philip Hamilton McMillan Memorial Fund established in 1922. It is not exactly a book to be read through, but rather an expanded dictionary which will prove useful to anyone who wishes to lay his hand on passages from both ancient and modern writers which throw any light upon the subject of healing gods. Dr. Jayne, possibly because there is so little known about definite gods of healing, has stretched his terms of reference widely. He includes deities remotely connected with healing, such as Aristaios, and the innumerable secondary deities of the Roman Pantheon, such as Prema, Vitumnus, Abeona, Adeona, Intercidona, Pilumnus, and Deverra, at whom St. Augustine poked fun in his great work De Civitate Dei. The three deities last named were personified at the birth of a child by three men carrying respectively an axe, a pestle, and a besom, with which they struck the threshold, that by the use of these signs of agriculture the wild wood spirits might be prevented from entering and harming the baby. On p. 444 Dr. Jayne refers to the portent of the birth of an hermaphrodite, and gives two references to Livy as to the procedure upon such an occasion. He would have found many other references in the Libellus Prodigiorum of Julius Obsequens, who gives about a dozen instances; the unfortunate child was disposed of by being thrown into the sea or into a river. Julius also refers upon many occasions to the birth of monsters, and upon one occasion to a child with an imperforate anus. Dr. Jayne deals not only with Roman deities, but with those of Egypt, Assyria, ancient India, Phœnicia, ancient Persia, Greece, and the Celts. Among the last mentioned was a deity named Mogons, whose name "probably means the 'increaser.'" Apparently Thackeray was not aware of this deity, or surely he would have added him to the list of ancestors of Alured Mogyns Smith de Mogyns (formerly Muggins), whose genealogical tree began with Shem and one of whose more modern forbears was Mogyn of the Hundred Beeves under Boadicea. Sir Alured had seven children, so Mogons did not forget his descendant. We commend Dr. Jayne's book, especially for the accuracy and fullness of his references.

JOURNALS.

BRITISH JOURNAL OF CHILDREN'S DISEASES. Vol. XXII. October–December, 1925.—In a paper on Brain Tumours in Children: their General Symptomatology, based on the analysis of 125 cases admitted to the National Hospital, Queen-square, Dr. Macdonald Critchley discusses the phenomena common to all varieties of cerebral tumour met with in pædiatric practice. The rarity of the disease in infancy is shown by the fact that only three cases in the series occurred in the first three years of life. As regards localisation, 59, or 47·2 per cent., of the tumours were situated in the pons or cerebellum; 34, or 27·2 per cent., in the cerebral hemispheres; and 14 were classified as pituitary or suprapituitary. Tuberculomata were the most frequent type encountered, the masses being often multiple, gliomata came next, and them sarcomata, while gummata, endotheliomata, and neurofibromata occurred in much smaller proportions. In addition to the triad of headache, vomiting, and papilloedema, an alteration in the child's character was often an outstanding feature. As a rule the march of the disease was progressively downhill, but in some cases, especially in tuberculomata situated in the ponto-cerebellar region, one or two remissions might occur.—Dr. E. A. Cockayne reports two cases, with photographs and skiagrams, of Hypertelorism. From consideration of the six cases now on record he concludes that hypertelorism is a congenital but not a hereditary condition.—Dr. Thomas Brushfield contributes an illustrated article on the Plantar Lines in Mental Defectives, based on the study of the feet of 618 children in the Fountain Mental Hospital. The following lines were noted: (1) Crease lines: (*a*) transverse caused by flexion, (*b*) longitudinal caused by the movement of bringing all the toes together, (*c*) a delicate network of fine lines. (2) Plantar lines or folds—viz., the oblique plantar line which was an almost constant feature in the Mongol, the transverse plantar line, and the transverse hallucial line. Dr. Brushfield maintains that, owing to the constancy and persistency of these lines in mental defectives, they should always be looked for and their presence regarded as a stigma.—Dr. F. Parkes Weber records a case of Morbilliform and Bullous Eruption with Jaundice from Luminal in a Choreic Girl. Morbilli bullosi could be excluded, as not only did the child never seem really ill and had practically no fever, but she had also a history of having had "measles" twice previously.—Dr. Parkes Weber also contributes a paper on Granuloma with Foreign-Body Giant-Cells due to the Injection of Ether into the Panniculus Adiposus.—Dr. Angelica Panayotatou, of Alexandria, reports a case of Cystitis caused by *Amœba histolytica* and *Schistosoma mansoni* in a Native Boy aged 7 years. Recovery followed treatment by intramuscular injections of emetine hydrochloride.—The abstracts from current literature are devoted to diseases of the genito-urinary system.

New Inventions.

THE PENFOLD INCLINABLE EYEPIECE APPLIED TO HÆMATOLOGY.

LABORATORY workers who have frequently to make use of a hæmocytometer have deplored the necessity for having the microscope in the vertical position, which is both uncomfortable and fatiguing. With the apparatus here illustrated the object on the stage of a vertically disposed microscope can be viewed as comfortably as if the instrument were inclined. The prisms are so adjusted as to permit of any convenient angle of inclination of the limb bearing the eyepiece. The hæmocytometer, with its liquid contents, remains flat on the stage of the vertical microscope, but the observer can perform the enumeration in the usual position for comfortable microscopy. I have not found any difficulty to arise from the reversal of the image and feel that accuracy is probably gained by the greater comfort in which work can be done.

The makers of the apparatus are Messrs. W. Watson and Son.

A. PINEY, M.D. Birm., M.R.C.P. Lond.

THE LANCET.

LONDON: SATURDAY, JANUARY 30, 1926.

MILK PASTEURISATION AND BOVINE TUBERCULOSIS.

WHOLE-HEARTED advocates of pasteurisation of milk-supplies base their faith on the fact that the reduction in the general bacterial content of the milk thereby achieved, and more especially the complete removal therefrom of occasional contaminants of high pathogenic importance, such as the bacilli of typhoid and tuberculosis, are considerations which should be fully weighed by those responsible for the public health. They are in no sense opposed to campaigns for the more general production of what is spoken of as "clean milk." On the contrary, they welcome all attempts to raise the standard of hygiene at the farm and dairy and likewise those efforts which the intelligent dairy farmer and the Ministry of Agriculture are making to eradicate tuberculosis from dairy herds. They recognise, however, that progress in these directions must perforce be tedious and that the health of the community, and more particularly of the child, cannot be allowed to suffer in the meantime if an immediate remedy is available. Their standpoint, in fact, would be precisely that of those who advocate prophylactic immunisation as an immediate remedy to be applied where general hygiene fails or lags.

Opponents of pasteurisation have complained (1) that the procedure advocated may whitewash a really grossly contaminated milk; (2) that the vitamin value of the milk is interfered with; (3) that pasteurisation does not perform what it claims to perform in the matter of germ reduction; and (4) that in particular there is no guarantee that occasional tubercle bacilli in milk are killed by the procedure in question. With regard to the first and third objections, there can, of course, be no doubt that grossly contaminated milk may acquire fictitious merit as judged by bacterial content and that certain forms of pasteurisation plant cannot effect the desired reduction in germs for the simple reason that disinfection by heat is a time process. It is certain, however, that inadequate cooling of milk after the pasteurisation process and carelessness in the preservation of milk, whether in the milk-shop or in the home or both, account for much of the subsequent rise in the bacterial content which has been alleged to take place in pasteurised milks. The difficulty can in great measure be overcome by delivery of the pasteurised and cooled milk in sealed bottles. The second objection has, we believe, a certain amount of validity, at least theoretically, by reason of the fact that the antiscorbutic vitamin does suffer some destruction during the pasteurisation process. Milk, however, is a poor source of this vitamin to start with and the defect can be readily made up with orange juice. As regards vitamin "B" and the fat-soluble vitamins, the chances of destroying these at the pasteurisation temperature are remote. The fourth objection to pasteurisation would be a very serious one if it were well founded, because we would be inclined to risk all the other alleged imperfections and disadvantages of the method if there was a certainty that the communication to children of tuberculosis of bovine type could be averted. That there should be doubt even at this time of day regarding the time-temperature factors necessary to kill tubercle bacilli in milk is, perhaps, not surprising when it is remembered that the aim throughout has been to show not that temperatures short of the boiling-point can kill tubercle bacilli in a certain time, but that these bacilli can be effectively destroyed if the milk is brought up to, and maintained for a due time at a certain minimum temperature, consistent with the preservation of the physical, chemical, and nutritive properties of the milk.

The time-temperature condition now generally adopted both in this country and in America is 62·5° C. for 30 minutes, excluding the period of time required for raising the milk to the desired temperature. Objection has been taken to much of the experimental laboratory work on this question on the ground that it has been carried out with milk artificially contaminated with cultural tubercle bacilli and that in naturally infected milk from cows with tuberculous udders the infective bacilli may be tucked away in particulate purulent or mucoid masses which the disinfecting process does not effectively reach. It has even been alleged, though without the slightest evidence, that the tubercle bacilli, if affected at all, are merely reduced in virulence. Whether a particular commercial plant can on the large scale repeat laboratory conditions of experiment is not germane to the argument, but it is obvious that unanimity in the effectiveness of a particular laboratory procedure is a necessary preliminary to any campaign designed to render commercial plants more effective and more deserving of public confidence. In a communication on this subject which we publish in our columns to-day, Dr. R. G. WHITE records a very extensive series of experiments carried out in the bacteriological department of the Lister Institute and designed to test whether naturally or artificially infected milk is rendered non-infective for guinea-pigs when subjected under laboratory conditions to a temperature of 62·5° C. for 30 minutes. The results of Dr. WHITE'S experiments, which were all very carefully controlled, show clearly that no danger need be feared from milk even massively infected with tubercle bacilli provided it is subjected to pasteurisation under the conditions prescribed. There is, indeed, some evidence that the period involved in raising the milk to the required temperature (about 8–10 min.) and the holding of it for periods less than the prescribed 30 minutes may suffice to annul the infectivity of the milk.

It is clear, however, that if commerical pasteurisation is to ensure freedom from bovine tuberculous infection, the plant must be so designed that the milk passing through the machine is really brought up to a temperature of 62·5° C. and maintained thereat for half an hour. Nothing less will serve.

THE INTRAVENOUS ROUTE.

DRUGS may be administered in many ways, but, practically speaking, no matter what the portal of administration, they all reach the circulating blood. This is generally the result aimed at, for by no other method can the effect of the drug on the body as a whole be secured. If the substance be injected into a vein, then its dissemination by the blood-stream unchanged is ensured at the outset, and this would appear at first sight to be the most desirable method for the administration of remedies. Certain drawbacks, however, present themselves, of which undoubtedly the most important lies in the rapidity of the addition

to the blood of a foreign substance. Quite apart from such factors as bacterial contamination and actual toxicity, there is a growing body of opinion that the injection of foreign substances into the blood-stream is in itself a risky business.

In America, where intravenous therapy is very widely practised, Dr. P. J. HANZLIK, of San Francisco, has repeatedly called attention [1] to this risk. After many experiments involving the administration of a wide range of substances he has arrived at the conclusion that there are at least two factors to consider. There is first the essential toxicity of the substance, and secondly what may be termed a non-specific toxicity. In experimental animals the intravenous injection of almost any substance is attended with definite changes which include fluctuations in the blood pressure, collapse, shock, and symptoms bordering on anaphylaxis. The seat of these changes may be at the site of injection, in the capillary bed, or in distant organs such as the liver. Further observations pointing in the same direction have been made by Dr. J. B. CHRISTOPHERSON and Dr. S. R. GLOYNE, at the City of London Hospital, and appear in the present issue of THE LANCET. They find that intravenous injection of antimony in animals produces capillary dilatation, serous effusion, and hæmorrhage into lungs and spleen, but that the chief brunt of attack falls on the hepatic cells and to a less degree on the kidney tubules. The same parenchymatous degeneration of liver and kidney was evident in the case of an accidental overdose of intravenous antimony in man, and the authors note the occurrence of hypersensitivity produced by antimony injections in doses well below the toxic limit. Whether or no the liver is associated with the non-specific toxicity is not definitely decided, but we have ample evidence that the liver suffers in the long run from the essential toxicity of the drug injected. It would almost seem as if this useful organ sets out to defeat the aims of intravenous medication by promptly absorbing and storing away the drug so administered, particularly if it be a metal. The kidney again excretes as much as possible, with the result that the concentration in the blood is rapidly diminished. The body, in fact, gets rid of the intruder from the blood as quickly as possible, no matter at what sacrifice.

At the present time intravenous therapy is chiefly used in such systemic infections as syphilis, in various tropical diseases, and in blood transfusion. In the last named a whole series of fresh and interesting factors have to be considered in addition to those already mentioned. Should lysis of the donor's blood take place, the resulting hæmoglobin is excreted by the kidney where, under certain circumstances, it may block the tubules, producing fatal obstruction and uræmia. This precipitation of hæmoglobin in the renal tubules has recently been shown by S. L. BAKER and E. C. DODDS [2] to depend on two factors in the urine—namely, its acidity and its salt concentration. Such precipitation can be avoided in animals by keeping the urine dilute and alkaline. It is therefore suggested that when there is evidence of hæmolysis in the receiver's blood resort should at once be taken to alkaline transfusion. These observations may have a direct bearing on intravenous medication and serve to confirm a recent editorial statement in the *Journal of the American Medical Association* that ignorance in this field of intravenous medication demands the greatest caution and conservatism.

[1] Hanzlik, P. J., De Edo, F., and Tainter, M. L.: Arch. Int. Med., 1925, xxxvi., 447. Hanzlik, P. J.: California and West. Med., 1925, xxiii., 161.
[2] Baker, S. L., and Dodds, E. C.: Brit. J. Exp. Path., 1925, vi., 247.

MONEYLENDING AND MEDICINE.

THE Joint Select Committee which last year considered proposals to amend the Moneylenders Act was more than once invited to detect affinities between the professions of moneylending and of medicine. One moneylender dwelt on the fact that both professions have to respect the confidence of their clients. Another was willing to see advertisement abolished because the doctors got along all right without it. There was evidence indeed of further bonds—if the word be not too equivocal—between medicine and usury. Athough one witness was shocked at the suggestion that he circularised the names in the Medical Directory, another admitted that he might sometimes address himself to all the doctors in a particular area. There was also produced for the Committee's inspection a circular which began :—

"DEAR SIR,—May we inform you that we specialise in making strictly private cash advances to medical practitioners, entirely without security, repayable by convenient monthly or quarterly instalments out of panel or other fees."

A recent pamphlet [1] places doctors third in the list of classes victimised by moneylenders, the first place being assigned to expectant heirs and the second to clergymen. Naturally, it is unlikely that the moneylending fraternity would overlook the medical profession. Its members, more perhaps than those of any other calling, have to mortgage the future by an outlay of capital—for the purchase of a practice, a house, or a motor-car—often in anticipation of the fees which will recoup the expense.

No laws have succeeded in suppressing usury. It cannot be denied that the lending of money is a valuable social service. Equally it cannot be denied that the system produces grave abuses. It seems trite and unnecessary to warn professional men not to borrow from moneylenders so long as money can be raised through a bank or an insurance company. And yet a well-known solicitor informed the Committee that he had often known "extremely clever professional men, doctors and others," entangle themselves desperately in the moneylender's toils, not because they were hopelessly insolvent at the beginning but merely because they were so unbusinesslike as not to realise that they could get the money elsewhere. He explained how he had sometimes freed them from their troubles and paid off the moneylender by raising funds from an insurance company or from a bank by means of two sureties or an insurance policy. It is probable that these men went to the moneylender because he offered the usual protestation of "strict privacy." The offer is illusory. As soon as the borrower gives his name and address the moneylender passes on the information to an inquiry firm in order to find out if there have been previous loans. Thus is explained the otherwise mysterious circumstance that as soon as a man has borrowed from one moneylender he at once receives a flood of circulars from others. When the borrower is harassed by an unscrupulous lender, the best defence is attack. Instead of waiting for the threatened writ from the moneylender, he should himself begin proceedings in the Chancery Division and ask for relief on the ground that, in the language of the Act of 1900, the rate of interest is excessive and the transaction harsh and unconscionable. The mere institution of such proceedings has been known to induce a marvellous reasonableness in the lender. But of course such action involves publicity, and publicity is a lever in the lender's hand. A shrewd observer advised the Committee that no change in the law would be satisfactory unless it deprived the moneylender of his three weapons—pressure of publicity, pressure of bankruptcy, and pressure of costs.

The Bill which the Committee's discussions evolved gives some defence against the threat of bankruptcy,

[1] 3000 %, or the Borrower's Book on Moneylending. By H. H. Kelsey, solicitor of the Supreme Court. Anti-Moneylending Association. 2*s*.

but does not appear to adopt the proposal that all moneylenders' claims should be dealt with primarily in chambers and not in open court. One moneylender before the Committee frankly admitted that his trade had four abuses—misleading advertisements, preliminary fee-snatching, excessive interest, and harsh enforcement of the default clause. With all these the Bill deals faithfully. Circulars and advertisements are virtually prohibited, charges for preliminary expenses are forbidden, the force of the default clause is limited, and a savage rate of interest is mitigated. It is proposed that, if the rate exceeds 4 per cent. per month, the court shall presume the transaction to be harsh and unconscionable unless the contrary is proved. This throws the onus of proof upon the moneylender, and (an important point) if he fails to discharge the burden he will presumably have to pay the costs of the action. The Bill goes further. It eliminates the moneylender's tout, prohibits the assignment of a loan, and requires the moneylender to be licensed, for which purpose he must obtain a certificate from the local bench of magistrates, the certificate being exposed to forfeiture or endorsement if he misbehaves. The proposed legislation will not make moneylending impossible; it is not intended to do so. It will, however, spike the guns of the unscrupulous moneylender and relieve the misery of his victims.

THE HAGUE CONFERENCE ON SMALL-POX.

AN important conference, arranged by the Health Committee of the League of Nations, met at The Hague from Jan. 4th to 7th to examine outstanding questions in connexion with small-pox, alastrim, and vaccinia. This conference was attended by Prof. Ricardo Jorge (President), Prof. Madsen, Sir George Buchanan, Dr. Carrière, and Dr. Jitta, commissioners appointed by the Health Committee, with the following experts: Dr. Mervyn H. Gordon and Dr. F. R. Blaxall (England), Prof. Gins (Germany), Prof. Soberheim (Switzerland), Dr. Levaditi (Pasteur Institute, Paris), Dr. Terburgh and Dr. van Bonwdijk Bastiaanse (Holland), along with Dr. Norman White and Dr. Olsen representing the Secretariat of the Health Section of the League. The subjects had received preliminary consideration by the Health Committee and by the Permanent Committee of the Office International d'Hygiène Publique at a plenary session in Paris, when a draft scheme was drawn up by Prof. Jorge to form the basis of discussion at the conference. As a result of its deliberations, the conference formulated a series of conclusions on the methods to be adopted for continuing and intensifying the research work now going on. It was decided: (1) To pursue the study of alastrim as fully as possible, from a clinical as well as from an epidemiological point of view. (2) To carry out certain inquiries at vaccine institutes with a view to formulating conclusions as to the essential matters over which Government control should be uniformly exercised, and also to secure data for comparison of the different tests proposed for measuring the potency of vaccine lymph. (3) To give close attention to the affections of the central nervous system which have been reported to have followed vaccination in some countries. The nature of these cases, which are extremely rare in comparison with the large number of vaccinations performed, is not yet determined, and for this very reason inquiry is needed. The conference decided to request the League of Nations to invite the various Governments with which it is in relation to collect information from their public health authorities, and to communicate it to the Commission. The Commission will then collate and report on all the data obtained, while technical investigation will be carried out by the expert members with the necessary assistance. It is understood that a committee to be appointed by the Ministry of Health will carry out the work in this country in collaboration with the foreign observers.

Annotations.

"Ne quid nimis."

THE HEALTH OF THE ARMY IN 1923.

THE report on the Health of the Army for 1923 appears only ten months after its predecessor, and it is evident that the leeway of the war is being made up. The statistics presented all seem to be encouraging and there is evidence of a gradual lessening in disease. We may here quote some of the figures; those in decimals are proportions per 1000 men, and those in parentheses are the figures for 1922 given for comparison.

There were among officers 286·9 (298·3) admissions to hospital, for which malaria was the commonest single cause. The officers' death-rate was 3·93 (4·48); there were 10 deaths from injury and 7 from pneumonia. Losses by invaliding are unstated, as is usual in these reports. Among other ranks admissions were 484·0 (515·8) and malaria was again the most frequent cause, though gonorrhœa was responsible for more time lost in hospital than any other disease. The death-rate was 2·84 (3·22) and 175 died from injury, 57 from pneumonia, and 50 from specified diseases of the digestive system. There were 41 suicides which are not included in the 2·84 per 1000 mentioned above. Invalids finally discharged were 14·50 (19·31), and this rate covers 451 men discharged for inflammation of the middle ear and 256 for tuberculosis. The proportion is almost identical with that noted in 1922. Admissions increased from malaria, sand-fly fever, inflammation of tonsils, and dysentery, and decreased from influenza, venereal diseases, scabies, and diseases of the digestive system other than tonsillar and hepatic ailments. Iraq was the only important station which showed an increase of admissions, the most noticeable being dysentery, malaria, and sand-fly fever. Pulmonary tuberculosis, 2·9 (2·5), slightly increased in the Army of the Rhine. The report has been remodelled, and has now half as many pages more than formerly, and these are in larger type. It begins by discussing individually the most important diseases, and there follow special reports on medicine, surgery, hygiene, pathology, dental treatment, and the examination of recruits. Stovarsol was found to be most effective with relapsing amœbic dysentery, and tartar emetic with oriental sore. Recent alterations in the regulations for the accommodation of troops in transports have reduced tonsillitis by two-thirds, and diseases of the respiratory system by one-half. The report on pathology mentions a chronic tuberculous ulceration of the skin of the penis, for a time thought to be venereal, and a spheroidal-celled carcinoma of the appendix which recurred in the cæcum and caused fatal obstruction. The preparation of vaccines and sera at the Army Medical College is thought to have saved the State £12,650 in 1923. Dental treatment was required by 63·9 per cent. (74·23) of the men and two-thirds of them had their treatment completed. Scaling and cleaning of the teeth is done when necessary, and stomatitis and gingivitis were considerably reduced. As to recruiting, 376·64 (375·22) candidates for enlistment were refused at once and 40·09 (32·09) were rejected within six months. In this last group there were 2354 men, and it is estimated that each of them cost the State about £50. The chief causes of rejection were loss and decay of teeth, defective vision, defects of lower limbs, and deficient chest measurement. The causes of rejection which most increased in 1923 were middle-ear and heart diseases. It is observed that small-pox was very prevalent in this year in the United Kingdom, but great trouble was taken to secure necessary vaccination and re-vaccination, and no case occurred among the troops at home. Tuberculosis in the Army is thought to bear close relation to the standard of medical recruiting. It appeared twice as often, 2·9, in the Army of the Rhine as in the Army generally, 1·4. There were in

the whole Army 56·4 (70·7) admissions to hospital for venereal diseases, which was a considerable reduction. They were halved on the Rhine, 136·3 (234·2), and this is ascribed somewhat pessimistically to the increased value of the mark. The report well repays study for its observations on the prevention and treatment of disease.

CANCER IN TAR-WORKERS.

COMMENTING recently [1] on the death from cancer of a man who had been employed for 24 years at a municipal gas-works, we remarked that it should not be impossible to bring to the knowledge of all workmen concerned the protection which early treatment provides and the danger of delay. Sir Thomas Legge calls our attention to a leaflet on the subject issued by the Factory Department of the Home Office in June, 1924, entitled "Epitheliomatous (Skin) Ulceration as affecting Pitch and Tar Workers."

"Some pitch and tar workers develop small warts or ulcers on the skin of the face, arms, and very frequently in the neighbourhood of the private parts of the body, *especially on the scrotum, and it is these that may grow into the serious condition.*

"If a wart or ulcer appears on any part of the skin medical attention should be sought *at once*, so that a doctor can advise the proper treatment.

"All warts or ulcers do not necessarily grow into cancers, but those set up by pitch and tar and oil *may* do so, and are therefore best removed. This can be done quite simply. There is little fear of cancer developing under 10 years of employment and if the worker is under 35 years of age.

"The only treatment known to be successful at the present time is to remove the growth completely by operation, and therefore the smaller it is the more easily can this be done, and the sooner it is treated the greater the chance of success. *Delay may make all the difference between success and failure.*

"Fortunately, the form of cancer which is the most curable by operation, so that it will not recur, is cancer of the skin.

"It is, therefore, very important to keep the skin healthy and the pores of the skin open. The only way of keeping the skin healthy is by frequent washing with soap and water. The scrotum needs it as much as any other part. If this were done throughout life the trouble probably would not occur."

We are informed that 12,500 copies of the leaflet have been issued to the staff for distribution in factories in which tar is used and that it has been reproduced substantially in a leaflet issued by the Amalgamated Association of Operative Cotton Spinners and Twiners which has been twice distributed to the 30,000 mule-spinners in Lancashire.

THE REWARDS OF MEDICAL DISCOVERY.

As our readers know, Sir Ronald Ross has long held that those who make important discoveries in medicine should receive ample pecuniary recognition from the State, preferably in the form of life annuities. He returns to the matter in the January number of *Science Progress*, and urges that part of the rather considerable sums which are now spent on encouraging research should be devoted to rewarding discoveries which have been made. In theory the proposal is so sound that it is difficult to find anything to say against it. If anyone would discover the cause of the common cold or of muscular rheumatism to be such that the knowledge gave us the means of preventing these appalling diseases, it is not extravagant to think and even to say that the State should give the discoverer anything he wanted, at any rate up to the level of dukedoms, palaces, and princely fortunes. And the man who found out how to prevent a disease such as pernicious anæmia, which by comparison produces a negligible amount of human suffering, might well have £1000 a year for life or something of that order.

The principle is sound enough; the difficulties arise only in its application. In the first place, who is it that discovers anything? Discovery is a process, not an event. The man who periodically steps out into the limelight and tells people about it and persuades them that there is something in it is only one of the links in a chain that had no beginning and will have no end. It is true that some of these links are very conspicuous and much more important to the advancement of knowledge than the average. There is, too, a good deal in the proposal that the truth and value of any theory is in proportion to the degree to which it opens up fresh fields to the imagination; this it will not do unless it wins pretty general assent, so that a higher place is rightly given to Darwin for making everybody think about natural selection than to the gentleman who anticipated his ideas in an appendix to a book on ships' timbers. But at the other end of the scale we have medical discoveries of the greatest moment for which it would be quite impossible to honour any individual by any method of selection more just than drawing names out of a hat. If the children who live by the reduction of infantile mortality in the last 15 years wanted to put up a monument to their preserver, they could not get much nearer than an Epstein panel. And in the second place, if it is possible in some instances to define discoverers, who is going to have the courage to define them and value them against one another? It might be done moderately well by a body as detached and remote as the Nobel Prize Committee but hardly by anyone nearer home. Perhaps the League of Nations would undertake it.

Such are a few of the more obvious practical difficulties. It is possible that they might in some degree be evaded and that some discoverers might be pleased, and more supposed discoverers more pleased, without the rest being dissatisfied beyond toleration. But we think Sir Ronald Ross is almost wholly wrong in thinking that such a system of rewards would "encourage" medical discovery. The synthetic idea which is nearer the common notion of original discovery than anything else generally comes by way of revelation, and like other revelations it comes to people who are not particularly looking for it. One man may by nature be more receptive than another and training may increase his sensitivity to some extent. But it seems scarcely reasonable for anyone to embark on a search for a revelation because it may be worth £10,000; there is no evidence that they are to be had that way.

CATALOGUE OF HUMAN PROTOZOA.

TWENTY-FOUR years ago there appeared the first part of one of the most useful and comprehensive biological bibliographies which have ever been planned—namely, the "Index Catalogue of Medical and Veterinary Zoology," by Prof. C. Wardell Stiles and Mr. Albert Hassall. Begun under the auspices of the Bureau of Animal Industry, United States Department of Agriculture, the first section, comprising 35 parts, was completed in 1911. Running to over 2700 pages, it furnished a complete list of all published books, papers, articles, &c., dealing with medical and veterinary zoology, together with references to all reviews, critiques, and abstracts of these, arranged under the names of the various authors. The second, or Subjects, section of the Catalogue appeared from 1908 to 1920 as a publication of the United States Public Health Service and has, so far, dealt with the various species of parasitic worms hitherto found in man, in domestic stock, and in all other animals. In this section are to be found records of references to every known species of parasitic worm. The first part of the third section, or host catalogue, has recently been published [1] in the form of a small fascicle of 93 pages, and deals with the species of protozoa which have from time to time been recorded as parasites of man. In its original design it purported

[1] THE LANCET, Jan. 16th, p. 153.

[1] Key Catalogue of the Protozoa Reported for Man. Hygienic Laboratory Bulletin, No. 140, Treasury Department, United States Public Health Service, Washington, D.C. 1925.

to be a guide for use by the class of medical zoology in the Hygienic Laboratory, but its scope is actually much more extensive than that and, indeed, it will prove a much-prized addition to the library of the specialist. Prof. Stiles needs no introduction to the circle of English zoologists, for his name has long been well known for his persistent efforts to stabilise modern zoological nomenclature. For the most part the entries in the Catalogue do not diverge much from the teachings of standard English text-books. The generic name of the parasitic amœbas is, however, written *Endamœba*, not *Entamœba* as so frequently occurs, and the valid species are given as *coli*, *histolytica*, *gingivalis*, and *muris*. The *Flagellata* and the *Sporozoa* are treated more or less according to rule, and we find the *Spirochætacea*, or spirochætes, included as a subdivision of the flagellates. The classification of the spirillar organisms has always provoked much debate, the trend of which is impartially indicated. The malaria parasites receive full consideration, and special attention is devoted to the somewhat difficult classification of the *Piroplasmidæ*. Not the least interesting section of the work is the last, entitled "Protozoa, Miscellaneous," amongst which we find such entries as *Chlamydozoa* (*vera* and *strongyloplasmata*), *Protobios*, *Rickettsia*, *Unicellula* and others which have in recent years become prominent in connexion with the study of cancer and the filtrable viruses.

REPAIR OF THE URETER.

WHEN a segment of a ureter has been removed, either by accident or by operation, and the ureter can be neither implanted into the bladder nor united end-to-end, is there any method by which the urine can be conducted into the bladder? Dr. L. L. McArthur [1] reports a case in which he applied, with success, to the ureter the method which he has employed for the common bile-duct. The left ureter had been divided eight months previously by a severe blow which also fractured the left three lower ribs and the left transverse processes of the second and third lumbar vertebræ. The result was a lumbar urinary fistula. At operation the ureter was found divided 2 inches below its upper end. The ureteral ends were 1 inch apart and could not be brought into apposition. Dr. McArthur describes his technique as follows: A longitudinal slit was made in the side of the proximal portion of the ureter, sufficiently long to admit two catheters. One of these, a rubber urethral catheter, was inserted upward to the renal pelvis; the other, a ureteral catheter of good size, downward so as to pass out of the cut end of the renal portion and bridge the gap to the cut end of the vesical portion. The two cut ends of the ureter were then approximated as closely as possible by absorbable stitches. The catheters were then brought to the surface and permanently secured to the skin by stitches or other device. The urine from that kidney was thus diverted from the field of operation during the time of epithelisation. The body tissues were thus able to heal around the catheter bridging the gap between the renal end and the vesical end, the catheter simply remaining in situ until, in the judgment of the operator, an epithelial lining had had time to grow between the ends. Dr. McArthur does not claim to have determined the length of time required for epithelisation. In the case recorded, after the catheters had been placed in position, the gap between the ureteral ends was diminished by sutures to ¾ inch. At the end of nine weeks both catheters were removed, when no further urine escaped from the wound, which healed immediately, the quantity of vesical urine being doubled at once. Nineteen months after operation the patient was well in every respect. Dr. McArthur considers a fascia transplant to be unnecessary for epithelisation of the gap, and believes that epithelium grows from each end of the divided ureter and lines the tissues surrounding the portion of catheter which bridges the gap. No mention is made of the possibility of ultimate stricture at the site of the gap.

[1] Surgery, Gynæcology, and Obstetrics, December, 1925, p. 719.

INSULIN DISAPPOINTMENTS AND HOPES.

THOSE who hoped that the administration of insulin to a diabetic might lead to the cure of the underlying disease are apparently to be disappointed. As a result of observations lasting from 11 to 18 months on five selected cases of diabetes mellitus, no evidence has been obtained by Dr. G. A. Harrison [1] of even a partial remission of the disease. The daily intake of carbohydrate, protein, fat, and calories remained fixed throughout. The dose of insulin was adjusted to thefixed diet according to the results of estimation of the blood-sugar content. All five patients needed as much or slightly more insulin at the end of the period of observation. Such fluctuations in dosage as occurred are considered to be due to the difficulties in balancing the dose accurately against the diet, to increase in metabolically active tissue, and to variations in the strength of different batches of insulin. Using the same batch of insulin, on a fixed diet, with the patient's daily routine kept as regular as possible, the blood-sugar curve remained remarkably steady. Every now and then, on changing over to a new batch of insulin, a patient suddenly appeared to relapse, or, on the other hand, suddenly developed hypoglycæmic symptoms. Simultaneously, the blood-sugar curve rose or fell. These differences between batches were much less noticeable in 1924 than in 1923, when the methods of standardisation were in their infancy. During the last six months of the investigation (September, 1924, to February, 1925) all these special patients were treated by the same batch of insulin, which arrangement Dr. Harrison describes as a great boon to the patients and to himself. He recognises that every possible care and skill has been exercised to standardise insulin, and notes that since the spring of 1925 successive batches have appeared to be of more uniform strength. This period probably corresponds with the use of the new comparative method of assay devised by Mr. Marks, of the National Institute of Medical Research. It is stated in the recently published report of the Medical Research Council that further experience with this method has confirmed its value. Quantitative clinical tests by Dr. Harrison and Dr. R. D. Lawrence on volunteer patients, compared with the laboratory findings, are said to show a correspondence so satisfactory as to warrant the conclusion that the rabbit test in the form devised by Mr. Marks is, if carefully performed, capable of detecting any difference of activity which the most elaborate clinical observation could discover, and that a supplementary clinical test ought not to be required. This is very reassuring, especially since the National Institute of Medical Research has accepted, at the request of an International Conference, the duty of preparing and keeping the international standard of reference of insulin. A large supply of insulin, received from institutes and manufacturers in different countries, was purified and converted into the form of a dry, stable hydrochloride. Simultaneous determinations were made in five laboratories in the United States of America, Canada, and this country, the results varying only from 8·4 to 8·8 units per milligramme of the dried preparation. As a result, the International Conference decided that this preparation, preserved at the National Institute, should be the international standard for insulin, and that one milligramme thereof should be taken to contain eight units of insulin. Samples of this standard have already been supplied from the Institute to the responsible authorities in 16 countries. It may be hoped that we have now reached the stage when a diabetic, even if condemned to a constant dosage of insulin, may travel abroad without fear of being unable to obtain a preparation exactly corresponding to that which keeps him well at home.

[1] Quarterly Journal of Medicine, January, 1926, p. 223.

THE UNIVERSITY OF LEEDS.

WE published in October of last year an appeal made in behalf of the Medical School of Leeds University, and the close association of the school with men whose names will ever be eminent in the medical profession made a favourable reception certain. In the same issue (Oct. 17th, 1925, p. 821) will be found a sketch of the growth of Leeds University enumerating the leading points of a striking history of development. We have received this week from a correspondent in Leeds the following plea for the University in supplement of the appeal made last October, and showing the success which has already crowned the efforts made:—

"To anyone who has had the opportunity of observing the development of the University of Leeds the present appeal for the large sum of half a million pounds will appear fully justified. The Yorkshire College of Science, widened in its scope by the formation of a department of arts and simplifying its title to that of 'The Yorkshire College,' became ripe for university status in virtue of its amalgamation with the School of Medicine, and it was in fact admitted as one of the three constituent colleges of the Victoria University in 1887. Into the changes which have led to the founding of the independent University of Leeds it is not necessary to enter. Leeds was indeed opposed to the disruption of the University, but no one can now for a moment have any hesitation in saying that the establishment of three independent universities in place of the old federal university has been the best thing for each of them.

"Many important landmarks have been passed by the Yorkshire College of Science, by the Yorkshire College—both before and after its becoming a part of the Victoria University—and by the University of Leeds, since the first-named of these began its work in temporary premises while the first portions of the permanent buildings were being put up on the site that is now so fully covered. The amalgamation with the school of medicine and the formal opening of the College buildings by the late King when he was Prince of Wales was in a few years followed by a great effort which resulted in the building of the new Medical School and the provision of a library and of the great hall of the University. These were opened in 1894 by our present King when he was Duke of York. The University was also honoured by a visit from King Edward in 1907 when some new laboratories were opened.

"The more urgent necessities of the University are as follows: The provision of a first-class library—the present accommodation for books being quite inadequate—larger and better lecture theatres, and, above all, a great extension of laboratory accommodation. The Medical School which was the expression of so much thought and care—and no one who saw it develop can forget the great work done by Mr. Scattergood, who was Dean of the Faculty of Medicine at the time it was built—is now too small, though it is satisfactory to note that very little alteration or scrapping has been required. It is clear, however, that the great development of the pathological department calls loudly for a separate pathological institute in immediate relationship with the present school buildings and with those of the infirmary. By arrangement much of the pathological work of the infirmary is carried on in the laboratories of the infirmary by the staff of the University under the direction of Prof. Stewart, who is also honorary pathologist to the infirmary. The provision of a pathological institute or block will be one of the first things undertaken under the new scheme.

"Though the appeal was launched as recently as last October at a public meeting presided over by the Duke of York, promises have already been received for £262,000. One donation calls for special comment. In connexion with the formation of a Cancer Research Centre for Yorkshire a luncheon was recently given to a representative gathering of ladies and gentlemen of Leeds and of the county by Lord Lascelles. At this luncheon Lord Lascelles was able to announce that he had received promises of £23,000 towards the project. Sir Algernon Firth then announced that his donation of £5000 which he had promised to the University Appeal Fund was to be increased to £25,000, which he was to give to the University through the Yorkshire Council for Cancer Research, on the understanding that this was to go towards the provision of a pathological institute as a part of the University with special laboratory accommodation for persons engaged in cancer research. The generosity of Sir Algernon Firth therefore ensures the very early realisation of a great hope which has been in the hearts especially of the members of the Faculty of Medicine, but which also has been an aspiration on the part of the present Vice-Chancellor and of his predecessor. Stimulated by the action of Sir Algernon, many offers of assistance came in at once and at the end of the meeting Lord Lascelles was able to announce that his promises had passed £30,000. Thus the Yorkshire Cancer Research Centre makes a good start with £55,000 towards the £75,000 which has been mentioned as the minimum required to carry on the work efficiently."

We referred last week to the magnificent generosity of Sir Algernon Firth in connexion with the Yorkshire Cancer Campaign. Such instances of individual generosity will in the end enable the evasive problems of cancer to yield their secrets—that is our assured belief. The fruits of intensive research may as yet be small, but not only are they real but they are full of broad promise.

REVEALING UNKNOWN LONDON.

THE healthy human body is unconscious of most of its functions; the majority of its processes go on quietly without supervision or report. In the same way the healthy city shows little evidence of those activities which maintain its health, and it is only on the rare occasions when there is a failure of water-supply, an overflow of storm water, or an epidemic of food poisoning that the average citizen remembers (usually without enthusiasm) that reservoirs and drainage and sanitary inspectors do, in fact, exist. Huxley was accustomed to say that deep breathing and a stomach of which one was never conscious were the best equipment for life, and many right-minded Londoners will apply the statement to fresh air and drainage. Nowadays, however, it is felt that the more a man considers his colon the more healthy he will be, and it is not surprising that the London County Council, tired of receiving kicks instead of halfpence, should insist on London having an elementary knowledge of its main drainage. In a series of booklets the Council is justifying its existence to the ratepayer, who does not know where his money goes and has no idea how carefully he is looked after, and the latest of an attractive series entitled "What the L.C.C. does for London" is devoted to public health.[1] The booklet is exactly what is required; it is simply written, well illustrated, and thoroughly interesting. A map of the tremendous sewerage system of the county adds greatly to the fascination of unknown London, and the section of the book which describes the main drainage is pleasantly instructive. It is stated, in a summary, that in 1889 the daily discharging capacity of the outfalls under the Board of Works was 688 million gallons, and of the storm relief pumping work 30 million gallons. The Council in that year took over the management of main drainage and has increased these figures by 814 million gallons and 817 million gallons respectively, so that the total capacity is now over 2349 million gallons, as compared with 718 in 1889. This figure is being still further increased. The daily average quantity of sewage flowing to the outfalls is about 250 million gallons, which is equivalent to a stream 20 feet wide and 5 feet deep flowing continuously at a rate of three miles an hour. A total of about 100,000 million gallons of sewage is treated each year at the Barking and Crossness stations, and over 2 million tons of sludge are also dealt with. The fleet of vessels, so familiar to travellers on the river, which conveys the sludge out to Black Deep, 12 miles off the Essex Coast, is being reorganised and will comprise four steamers of 1500 tons capacity and one of 1000 tons.

The other activities of the Council—those of an active and enlightened health authority—are mostly familiar to our readers, and it is unnecessary to mention more than one or two as examples of their results. Under the heading of Medical Inspection and Treatment we learn that in 1924 the proportion of school-children requiring treatment was 36·7 per cent. compared with 44 per cent. in 1918. Children suffering from lack of nourishment accounted for 5·9 per cent.

[1] The London County Council and what it does for London: Public Health. London: Hodder and Stoughton, Ltd.; University of London Press, Ltd. Pp. 35. 6*d*.

of these, compared with 12·8 in 1913; 17 per cent. more children leave school to-day with sound teeth than in 1913, and the proportion of children with defective hearing has been halved during the past ten years. At a time when there is much misinformed public opinion on medical subjects it is gratifying to find so instructive a work issued for the education of London's citizens.

MYOPE CLASSES.

THE report of the Council of British Ophthalmologists, a body representing the ophthalmic branch of the medical profession in Great Britain, which we print in another column, should be studied by all members of education authorities. A certain proportion of the children in our schools, without being blind, see so badly that they are totally unfitted for the ordinary school curriculum of book and desk-work. A number of these owe their defect to corneal nebulæ resulting either from corneal disease or from interstitial keratitis. Others have already become so myopic that even during school life they must be treated as partially blind. A much larger proportion of myopes, when appropriately corrected with glasses, see quite well enough to join the other children in the ordinary classes, but in their case, when the myopia reaches a certain degree, although visual acuity may remain good, it is not in the interests of the child to continue his or her education in the ordinary way because it has been proved that to do so may be prejudicial to his eyesight when he gets older (cf. THE LANCET, 1924, i., 907). For the sake of these different classes of children the London County Council so long ago as 1908 opened the first "myope school," but as the report says, it has been found that the best interests of these children are served if such classes are held in association with elementary schools where the oral teaching and physical exercises given in the ordinary classes are available. Unfortunately, the number of places in these myope classes is as yet by no means adequate to the need. Even in London, which takes the lead in this respect, there is only accommodation for 915 children, and in the rest of the country the supply is almost negligible. The reason for this, no doubt, is twofold—that such classes require special training in the teachers and that they must be limited in size, the maximum number recommended being 20. Both these essentials involve extra expenditure, and as we have been recently reminded, the present is not a time when such demands are likely to meet with a ready response. Nevertheless, the importance of the subject fully justifies the Council of British Ophthalmologists in recommending that in all large centres of population such special classes should be established, and further, that special instruction should be given to teachers and parents on the education and management of children with defective sight.

COLLECTED PAPERS FROM THE LONDON SCHOOL OF TROPICAL MEDICINE.

WHEN the London School of Tropical Medicine became the Tropical Division of the new School of Hygiene, founded in 1924, it was decided to continue the "Collected Papers" of the older institution in a slightly altered form, and the first volume [1] has now appeared. It is under the same able editorship as the "Collected Papers" and consists of two parts, one containing addresses of a more or less general character delivered from time to time by the Director, Dr. Andrew Balfour, and the other 35 laboratory studies reprinted from various professional journals. The charm of the Director's style is well known and it is pleasing to have seven of his essays gathered here together. In the first, "New Conceptions in the Teaching of Public Health," he takes as his text a Chilian address wherein England is cited as "the cradle of hygiene," and reviews the changes in the hygienic outlook during 30 years and the aims of the new school. In his discourse before the Royal Institution that accompanied the Rockefeller cinematograph film he weaves a fairy tale from the history of malaria, tracing its destructive course from the night when "the angel of the Lord . . . . smote in the camp of the Assyrians an hundred and fourscore and five thousand," to the time when the enemy met its defeat at the hands of Ross and Manson and, still later, was harnessed to the chariots of its victors by being used as a therapeutic agent in the treatment of general paralysis. His third lecture makes live even the dry bones of the Provisional Scheme for the Diplomate in Public Health, while his fourth is a general survey—both historically and geographically—of "The Trend of Modern Hygiene." In "Vistas and Visions" he essays to attract Glasgow students to the colonial medical service by sweeping them on a magic carpet over the whole of the British Empire and giving them glimpses of the problems still awaiting solution. Into this journey he infuses a thrill and a romance that many a novelist might envy. "A Bit of the Bog" describes a journey through the Sudanese province of Bahr-el-Ghazal, while the last essay deals with the justification for the term "tropical disease."

The original papers reproduced in this volume have all been printed before, but it will be useful to the research worker to have them collected in one volume. Of particular interest to public health workers in this country are the papers by Dr. E. Hindle and Major H. C. Brown on Spirochætal Jaundice in Great Britain.[2] Mr. T. W. M. Cameron's article on Parasitic Diseases in Pigs and their Prevention, Colonel A. W. Alcock on the Anopheles Mosquito in England,[3] and Dr. Hindle on Leptospira in London Waters.

A FACIAL REFLEX.

Dr. Filippo Modonesi, of the Ospedale Maggiore, at Bologna, published [4] as far back as 1905 a description of a facial reflex which may be of importance in the diagnosis and prognosis of cases of severe apoplexy. In such cases where there is deep coma the relaxation of the whole body and abolition of motor reaction do not permit us to ascertain which is the paralysed side, especially as the ordinary symptomatic reflexes may be absent. The reflex consists in contraction of the facial muscles of expression caused by pressure on the bulbus oculi. Even in conditions of coma this "bulbo-mimic" phenomenon persists for a long time, and may be evoked when other means of exciting motor reactions fail. Compression of the ocular bulb is a convenient method, and one which may be graduated at will to act on an extensive terminal zone of so sensitive a nerve as the fifth. When in cases of coma the bulbo-mimic reflex is present on one side while it is found wanting on the other, we are justified in admitting an organic lesion of the opposite hemisphere. On the contrary, the persistence of the phenomenon on both sides serves as a means of differentiating other comatose conditions, such as uræmic, diabetic, or toxic, from those which accompany a circulatory lesion of one hemisphere. Only in very rare cases of profound coma is there found complete loss of motor reaction to compression of both bulbs. This reflex phenomenon is in some measure analogous to cortical reflexes, for when the coma disappears and the deep reflexes reappear, the bulbo-mimetic phenomenon remains abolished or diminished analogous to what happens in the normal cutaneous reflexes or the hemiplegic side. The bulbo-mimetic reflex described by Dr. Modonesi is useful as a clinical sign for the early diagnosis of hemiplegia and for determining the site of circulatory disturbances of

[1] Collected Addresses and Laboratory Studies of the London School of Hygiene and Tropical Medicine. Vol. I., 1924–25. Compiled by R. T. Leiper.

[2] Reprinted from THE LANCET, 1925, ii., 372.

[3] THE LANCET, 1925, ii., 34.

[4] Bullettin delle Scienze Mediche, Bologna, 1905, lxxvi., ser. viii., vol. v.

the brain in comatose conditions, distinguishing them from uræmic and diabetic coma, and also as a prognostic sign of grave significance in bilateral absence of the phenomenon. It may further serve as a useful sign as evidence of a peripheral paralysis in subjects in whom the ordinary method of investigation is not easy, as in the insane or alcoholic, and in children. Dr. Modonesi's publication of his observation of the bulbo-mimetic reflex preceded for some time that of other similar reflexes by Pierre Marie and C. Foix. In the latter's "Signe de la Face" the reflex action of the muscles of expression is obtained by pressure, not on the globe of the eye, but on the ascending branch of the occipital nerve. In each instance it would appear that a contraction of the facial muscles is produced by pressure of a painful character, and the two reflexes are not integrally different.

PURU.

THE specific infective disease caused by the *Treponema pertenue* is most commonly known by the name applied to it in Africa, yaws or frambœsia, but it also occurs in other parts of the world under various designations. Thus in Ceylon it is called "paran gi," in Fiji "coko," in the Pacific Islands "buba," and in the Federated Malay States "puru." The committee for public health education of Malaya has recently issued a pamphlet [1] on the disease, written by Dr. A. Viswalingam, with the object of encouraging close coöperation between public health workers and the general public in that part of the world, so that this intensely crippling disease may be eradicated. It is estimated that 60 per cent. of the natives suffer or have suffered from the disease which afflicts all ages, but is more prevalent in childhood, and particularly abounds in insanitary country districts where the filth and general unhealthy conditions favour the occurrence of the disease. Spread by sexual intercourse is apparently very uncommon, the more usual course of events being the entrance of the spirochæte through trivial wounds and abrasions on exposed parts. The incubation period varies from a few weeks to months, and the initial lesion is found at the site of infection and consists of a granuloma which arises in the deep tissues of the skin. A more characteristic initial lesion is the occurrence of one or more small papules which increase in size and secrete a viscid yellowish discharge. The second stage consists of eruptions which appear in successive crops and may last for years. Small granulomata appear some weeks or months after the parent sore and are accompanied by an irregular fever. Discrete forms are common in older and confluent forms in younger people. Pitted sores upon the feet are very common, and great thickening of the skin and bones of the arms and legs also occurs. The third stage consists of an exfoliative dermatitis of the palms and soles which may go on to a more severe thickening and fissuring, while the skin loses its pigment in patches. Treatment by salvarsan and its derivatives gives excellent results, as is shown by the photographs accompanying Dr. Viswalingam's monograph. Similar results were obtained by Dr. Winckel in Java, as our Berlin correspondent reported last week. The Federated Malay States Government has placed salvarsan within the reach of all sufferers. The question of prevention is largely bound up with matters of personal and domestic cleanliness, and measures are being undertaken to eradicate the disease by hygienic means. Dr. Viswalingam points out that some of the failure to curtail the disease in the past has been due to its being confounded with such other diseases as lupus, leprosy, and syphilis. He emphasises, however, that its symptomatology renders it a distinct disease, but it is unfortunate that in his otherwise excellent account of "puru" he makes no mention of the Wassermann reaction which other observers have found consistently positive in African "yaws."

[1] The Puru of Malaya: its Treatment and Eradication. London: John Bale, Sons and Danielsson. 1925.

CHORDOMA.

THE occurrence in relation to the vertebral column of tumours derived from notochordal tissue was clearly established by Ribbert in 1894. They are rare, but probably not as rare as they seem, for a certain number are doubtless unrecognised and unrecorded. A comprehensive account of the condition in the January issue of the *Journal of Pathology and Bacteriology*, by Prof. M. J. Stewart, of Leeds, and Dr. J. E. Morin, summarises what is known in a useful way and should lead to the identification of further examples; once it is known, the tumour may often be recognised at first sight. It occurs chiefly in situations corresponding to the ends of the notochord, *i.e.*, in the neighbourhood of the spheno-occipital synchondrosis and in the sacro-coccygeal region, about equally in each; only 3 cases out of 57 have been described in other places. More frequent in males than females, cases have occurred at ages from 16 to 72, the age of the sacral cases being distinctly the higher. It is usually of low malignancy, slowly infiltrative and destructive, especially of bone, and generally without metastases. The head cases give the symptoms of a slowly growing tumour of the base of the skull—headache, giddiness, failure of sight, cranial nerve palsies, &c. The sacrococcygeal cases suffer at first mostly from pain, and later pressure on nerves may give various motor, sensory and trophic disturbances in the legs; if the tumour extends mostly inwards pressure on the bladder and rectum may be very troublesome, if mostly outwards a characteristic external tumour appears and slowly extends. Anatomically the tumour is well encapsuled and divided into lobules by fibrous tissue trabeculæ; the substance is composed of translucent whitish or bluish gelatinous material, rather like a colloid cancer, which in the later stages may become almost liquid. The more malignant examples are more solid, firm, and opaque. Histologically the younger, more cellular areas have a solid epithelial aspect, alveolar in arrangement; in older parts the abundant cytoplasmic vacuolation produces the remarkable bladder-like physaliphorous cells and a sort of vacuolated syncytium, while the mucinous fluid which is formed at first cuts up the cells into columns and later forms a lake in which only a few scattered cells are visible. The microscopical structure is in this way rather various in different cases and in different parts of the same tumour, but it seems always to be recognisable. Prof. Stewart also deals shortly with the heterotopic notochordal tissue found about the dorsum sellæ—the "ecchordosis physaliphora spheno-occipitalis"—which is not so very rare if it is looked for, and which, with similar misplaced notochord in the sacral region, may possibly be the origin of chordoma. The paper gives a detailed account of the third example which has been met with in Leeds in recent years, and is followed by a description of an Edinburgh case by Drs. W. A. Alexander and J. W. Struthers. Others will doubtless turn up as the condition becomes more familiar.

INDEX TO "THE LANCET," VOL. II., 1925.

THE Index and Title-page to Vol. II., 1925, which was completed with the issue of Dec. 26th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

NORTH WALES MENTAL HOSPITAL.—The number of patients in the hospital is 1061. Of these, 935 are rate-aided cases, and the average weekly cost of maintenance during the past quarter was 19*s.* per head. The medical superintendent, Dr. Frank Jones, reports that the recovery-rate was maintained at a high level—51 per cent. for the last quarter, as against an average for similar institutions of 30 per cent.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CLVIII.—THE TREATMENT OF SALPINGITIS.

II.—CHRONIC SALPINGITIS.[1]

CHRONIC inflammation of the Fallopian tube, always associated with ovarian inflammation, may be of gonococcal, streptococcal, or tuberculous origin. Labour or abortion invariably precedes the streptococcal inflammations, but so long a time may have elapsed since pregnancy occurred that it is often overlooked as an ætiological factor. Whereas in the gonococcal cases a history of an acute attack some time previously is usually obtainable, in streptococcal cases this is usually not so, the course of the disease being insidious and chronic from the beginning. Tuberculous salpingo-oöphoritis is essentially a chronic condition, and only gives rise to acute exacerbations if secondary infection (usually of intestinal origin) occurs.

Whatever the organism may be, patients suffering from chronic salpingitis are semi-invalids, getting about with difficulty, always suffering from more or less pelvic pain, backache, dysmenorrhœa, menorrhagia, and especially dyspareunia. Examination usually reveals ill-defined pelvic swellings, on either side of or behind the uterus, having no characteristic shape, but invariably leading to more or less fixation of the uterus, which may be anteverted or retroverted. The fixation is a characteristic feature, and attempts to move the uterus in any direction always produce acute pain. This is perhaps the most important sign of chronic salpingo-oöphoritis. Tuberculous salpingitis can rarely be diagnosed clinically, unless it is associated with a general tuberculous peritonitis and ascites.

Palliative Treatment.

That many cases settle down and cease to cause important symptoms under palliative treatment is certain; for it is not uncommon, when operating for other diseases in women past middle age, to find tubes and ovaries fixed by adhesions, the former even containing pus, the result of a long obsolete salpingo-oöphoritis. The presence of pus in the tubes can rarely be diagnosed with certainty in essentially chronic cases, but where acute exacerbations occur—associated with fever, abdominal rigidity, and leucocytosis—pyosalpinx is probable. Even then the pus is invariably sterile, the acute exacerbations being due to secondary peritoneal infection via the intestine. Thus it happens that palliative treatment is often quite properly applied in cases even where the tubes may contain pus. Incidentally it may be remembered that intraperitoneal rupture of a chronic pyosalpinx is an exceedingly rare accident and its possibility may properly be disregarded. The reason for this is that a chronic pyosalpinx usually has very thick walls and is encapsuled by adhesions. Where a tuberculous origin is suspected—for example, in single women, in whom gonorrhœa can be excluded and pregnancy has never occurred—palliative treatment should not be adopted. The sooner a tuberculous tube is removed the better for the patient. The tuberculous inflammatory process has a great tendency to spread through the wall of the tube and to invade any adherent structure such as the small intestine or pelvic colon. If bowel is involved in the tuberculous process, removal of the tube always means damage to the bowel and subsequent rupture causing a fæcal fistula. Fæcal fistula follows removal of a long-standing tuberculous tube more often than any other operation, except that for a gangrenous appendix. The palliative treatment of salpingo-oöphoritis in general usually demands counter-irritation, and means directed towards the absorption of inflammatory products. Counter-irritation is best applied by vaginal applications of substances which have an affinity for water and set up a discharge from the cervix. In practice glycerine and ichthyol are the only substances of value. Glycerine may be applied to the vaginal roof on tampons of absorbent wool at night, whilst ichthyol is best used in the form of vaginal suppositories. Ichthyol, gr. xii., in cacao butter, gr. cxx., forms a convenient suppository. A hot plain water douche at 112° to 115° F. should first be given slowly so as to induce hyperæmia, and then the suppository passed up to the vaginal roof and left in all night. In the morning discharge and débris should be washed away with another plain water douche. Alternate nights for a fortnight is sufficient for this treatment, a week being allowed to elapse before repeating the course. If two courses of a fortnight do not produce decided relief from pain, it is generally useless to persist any further with palliative treatment. In combination with ichthyol treatment, radiant heat to the abdomen is often of great value. A home-made apparatus for this is easily contrived by making a cradle to cover the abdomen with two carbon filament electric lamps suspended in it. The amount of heat applied in this way can only be determined by experiment for each individual patient, since tolerance varies. The value of ultra-violet rays in these cases has yet to be determined, but it might be expected that benefit would ensue. X rays have been used and good results have been recorded. Given sufficient dosage to produce an effect, any benefit resulting is probably due to abolition of the ovarian functions and the sterilisation of the patient. Since most of these patients are already incurably sterile from closure of the tubes and disorganised ovaries, this is not a calamity. The abolition of menstruation might even be of advantage in that in most cases severe pre-menstrual pain occurs. On general grounds it is advisable that X rays should not be used in cases believed to be suffering from pyosalpinx, but should be reserved for non-suppurative lesions.

Drugs given internally have very little effect apart from the temporary relief of pain. Morphia, heroin, omnopon, nepenthe, in fact, any drugs containing opium derivatives, should be avoided owing to the danger of contracting a habit of taking them. Bromides are always valuable, whilst antispasmodic drugs like phenazone, especially combined with sal volatile, will often relieve pain. For menorrhagia it is best to rely on calcium lactate by the mouth, given in the form of a freshly prepared nascent solution. A mixture of pure lactic acid, gr. 200 by weight, with 75 gr. of precipitated chalk in ℥ viii. of chloroform water, gives a solution which contains 30 gr. to the ounce of calcium lactate; one ounce to be given every other night for a fortnight at a time.

Operative Treatment.

Although some of these cases will be permanently relieved by this treatment, the majority will prove intractable and operative treatment will have to be adopted sooner or later. This will always mean an abdominal section and removal of the affected organs. Conservative surgery must be adopted as far as possible to produce a symptomatic cure. In young women, where pre-menstrual pain is not complained of, a tube, ovary, or parts of them should be saved, if not too much damaged, in order that menstruation may be retained and the possibility of a future pregnancy not abolished. These operations are often very difficult and trying to the surgeon, but are rarely of great danger to the patient. As they are performed when active infection has disappeared, there is very little risk of general peritoneal infection even if a pyosalpinx is ruptured during removal, which, it must be admitted, is a common occurrence.

The Risk of Damaging the Bowel.—Very widespread adhesions will be encountered and the risk of damaging bowel during the separation of adhesions must always be borne in mind. Adhesions should be divided with the knife or scissors wherever possible, rather than

[1] An article on the Treatment of Acute Salpingitis by Mr. Stevens appeared in the previous issue of THE LANCET.

forcibly torn with the fingers. It is better to cut into the wall of a pyosalpinx and leave a fragment adhering to bowel than to risk opening the bowel by forcible separation of a firm adhesion. In tuberculous cases the risk of bowel injury is much greater than in any other type, and however carefully the operation is performed fæcal fistulæ will sometimes occur. In such cases the bowel may not actually be opened during the operation, but being infiltrated with tubercle may be so damaged that it perforates later. A fæcal fistula into the rectum or pelvic colon is not of so much importance, as it usually heals within two or three weeks, but a small intestine fistula is a tragedy as it may show no tendency to heal at all. When damage to the small intestine is recognised at the time, it is better to excise the damaged segment and do an end-to-end anastomosis or lateral anastomosis according to the situation of the lesion.

Drainage.—When the tubes contain pus and rupture occurs during removal the question of drainage has to be considered. If there is any doubt as to the infectivity of the pus the pelvis must be drained, preferably through a stab incision two inches away from the median incision, near the anterior superior iliac spine. In cases of long-standing in which the pus is certain to be sterile, drainage is unnecessary, but it is certain that in any doubtful case drainage makes for safety, and in general does no harm. As a rule 48 hours is sufficient for a large drainage-tube to be left in the pelvis, after which time it should be removed and a short length (half an inch longer than the thickness of the abdominal wall) of smaller tube substituted for another 48 hours.

After-treatment.—With regard to after-treatment I am convinced that early purgation prevents distension and makes for the comfort of the patient. Hence it is my custom to give calomel, gr. iii., in one dose 18 hours after the operation, a turpentine enema the evening of the day after the operation, and mistura sennæ composita, ℥iss., the evening of the second day after the operation. The calomel rarely produces an action of the bowels, but in general it starts peristalsis and prevents distension.

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Special Articles.

REPORT OF THE MEDICAL RESEARCH COUNCIL, 1924–25.

(*Concluded from p. 197.*)

RESEARCH SCHEMES IN SPECIFIC SUBJECTS.

AMONG the special investigations being pursued we choose for notice here those whose main purport can be effectively summarised.

Problems of Child Life.

In a series of over 500 infants examined by Dr. J. N. Cruickshank, Dr. J. Hewitt, and Dr. K. L. Couper at the Royal Maternity Hospital, Glasgow, it was found that neonatal death was due to disease or malformation of the child in about 16 per cent., to the complications of labour in about 33 per cent., and to maternal disease in about 50 per cent. of cases. The results of a report upon a series of 100 cases of toxæmia in pregnancy by the same workers indicate that in all forms of toxæmia in the second half of pregnancy there is disturbance of both kidney and liver functions, but the variations within each clinical group are so great that biochemical analyses of the kind made have given little help to prognosis for individuals. The most useful prognostic signs are found to be variations of the blood pressure and their relation to the degree of albuminuria present. The composition of milk in the early days of lactation is being studied by Miss Muriel Bond and Miss S. D. Widdows, working at the London School of Medicine for Women.

The collection of material towards the study of the causation of rheumatism in childhood, mentioned in previous reports, has been completed. Nearly 1000 cases have been examined from various sources, and the material is now being examined by Mrs. M. Forest Smith under the direction of Dr. John Brownlee. The results of an inquiry into the incidence of rickets among children under 2 years of age attending hospitals in London as out-patients will shortly be published. A consecutive series of children was examined at each of three hospitals, a radiograph of the wrist being taken in each case.

At the National Institute for Medical Research the mode of action of ultra-violet light in the prevention and cure of experimental rickets has been studied from several aspects by Mr. T. A. Webster. In confirmation of other workers he has found that practically any sterol-containing foodstuff can be rendered antirachitic by a suitable exposure to ultra-violet light.

Nutrition.

Dr. S. S. Zilva is investigating the chemical properties of the antiscorbutic factor. He has also been superintending the preparation of large quantities of lemon-juice for the stores of the *Discovery* whaling expedition, using the knowledge he has gained of the stabilisation of the antiscorbutic factor. This juice is being tested periodically, and the results will be compared with those of clinical observations made by Dr. Marshall, the medical officer of the expedition. The unsaponifiable fraction from cod-liver oil has been investigated in detail by Dr. J. C. Drummond and others. Results appear to indicate that the active material is represented by not more than 10 per cent., and probably a good deal less, of the unsaponifiable fraction from the active oil. In other words, the quantity of active substance required to enable the young rat of approximately 100 g. in weight to grow is of the order of two millionths of a gramme per day. Dr. Drummond has collaborated during the past year with Dr. O. Rosenheim and Mr. Webster at the National Institute for Medical Research. A series of colour tests have been devised, which it is hoped will form the basis of colorimetric methods of assaying vitamin A value. Already it is possible to compare the value of a number of samples of cod-liver oil by this means in a few minutes and to obtain a result at least as accurate as that given by animal-feeding tests requiring a month or six weeks. The growth-promoting and antirachitic properties exhibited by previously deficient food-mixtures after exposure to the short wave-length radiations of the quartz-mercury-vapour lamp have also been studied, and the activation traced to an effect on the fats present in the food. The substance activated was present in the unsaponifiable fraction, and was found to be of the nature of a sterol. Experiments with highly purified preparations of cholesterol showed that this substance acquires powerful antirachitic properties, and in some cases growth-promoting action, after comparatively short exposure to ultra-violet radiations. The same discovery was announced almost simultaneously by Hess and also by Steenbock in America.

During the past year the Committee upon Quantitative Problems of Human Nutrition have continued to advise and assist both private and official investigators upon various matters within their terms of reference. The section dealing with the diets of agricultural labourers in a report published by Mr. A. B. Hill was supervised by the Committee, and assistance has been given to the Food Section of the Ministry of Health in a study of prison diets. Dr. Major Greenwood, the secretary of the Committee, has undertaken

preliminary statistical work for a study of the physical and other characters of the school population which is under consideration by the Medical Department of the Ministry of Education. The Committee have been much impressed by the importance of a reassessment of the food-supply of the country comparable with but more extensive than that prepared for the Food (War) Committee of the Royal Society during the war. So soon as the data are available, the Committee will proceed with this investigation.

Two years ago work was begun in the medical unit of St. Thomas's Hospital under the direction of Prof. Hugh MacLean to ascertain what detrimental effect, if any, excessive protein diet exercised on renal function. Although medical writers are almost unanimous in declaring that high protein diet is harmful in kidney disease, yet it appeared that there is little sound evidence that this is so. Preliminary experiments gave irregular results. Ultimately it was found that the albuminuria and other evidence of renal damage claimed by various investigators to result from high protein feeding was apparently dependent on lack of vitamins or some other essential constituent of fresh food. The extreme sensitiveness of the renal system to lack of vitamins was found to be striking, and it was considered probable that attention to this point might be of importance in the general treatment of nephritis.

Disorders of the Cardio-Vascular System.

Under the direction of Sir Thomas Lewis at University College Hospital Medical School, Dr. A. N. Drury has made observations which throw an entirely fresh light upon the manner in which conduction deficiency displays itself in the auricular muscle. Cold, pressure, and increased acidity all depress the rate of conduction in auricular muscle and, if acting in sufficient degree, prevent the impulse from passing. These conduction defects are not due, as previously supposed, to change in the length of the refractory period, but to a phenomenon akin to that which has been described as "decrement" in nerve. The researches open up a new field of observation so far as cardiac muscle is concerned.

Miss E. P. Wolf has completed a series of observations upon local colour changes in skin deprived of its circulation, with particular reference to the nature of the red and white patches which then appear. She has confirmed Krogh's view that the red patches are due to leakage of blood into the skin through anastomoses with bone-vessels and that the white spots are influenced, but not solely, by temperature. Dr. B. Sacks has investigated the effects of intravenous injections of pituitary extracts in man. These act mainly on the capillaries and venules of the skin, producing intense paling of colour. The pallor is unaccompanied by more than a slight rise of blood pressure, but this slight rise is enough to distend the limb passively. It is probable that in man the pituitary body exerts its effects on the arterioles mainly in the visceral region. Dr. R. T. Grant and Sir Thomas Lewis have fully investigated the phenomenon called "reactive hyperæmia" in man. The hyperæmia is that which follows immediately upon the release of an occluded circulation. The reaction is independent of a nervous mechanism, central or local. It is thought to result from the accumulation of slowly diffusible substances, the products of chemical changes in the extravascular spaces. The mechanism is believed to be frequently or constantly in action in normal life and has much in common with that which locally controls the tissue circulation after injury and something in common with the vaso-dilatation which occurs in muscular exercise.

Dr. J. C. Bramwell and Dr. Sylvia K. Hickson have been studying the mechanism of production of the Korotkow sounds in man by means of graphic methods. The results suggest a new hypothesis to account for the production of the Korotkow sounds, which seems to explain anomalies in the auscultatory criteria at present adopted for the clinical determination of diastolic pressure.

Disorders of the Excretory System.

Dr. S. L. Baker, at the Middlesex Hospital, has described two cases of obstruction of the renal tubules caused by the excretion of hæmoglobin following the intravascular hæmolysis of transfused blood. Experiments have been made to determine the conditions under which hæmoglobin is excreted, and under which it is thrown out of solution in vitro. The results indicate that with the excretion of hæmoglobin in the glomerular transudate, which, like the blood plasma, is slightly alkaline, renal obstruction is due to the increase of the acidity and salt concentration in the tubules, which causes precipitation of the pigment probably in the form of hæmatin. This would explain the production of intrarenal obstruction in cases of the type described, and also in blackwater fever. A suggestion for the treatment of these conditions is accordingly the production of an alkaline diuresis.

The results of work by Dr. Mona Kirkhouse upon the effects of diuretic drugs show that drugs of this group, though very commonly used in current practice, are of little use in the treatment of dropsy due to nephritis, being unnecessary in mild cases and ineffective in severe ones. In œdema due to heart failure some diuretics can be used with advantage, digitalis for instance when the failure is due to auricular fibrillation, and drugs of the caffeine group when the heart rhythm is regular.

Mental Disorders.

The composition of the committee dealing with this subject, in which the Council coöperate with the Board of Control, is as follows: Dr. Henry Head, F.R.S. (chairman), Dr. Thomas Beaton (secretary), Dr. C. H. Bond, Dr. Henry Devine, Prof. G. Elliot Smith, F.R.S., Sir Frederick W. Mott, F.R.S., and Prof. G. M. Robertson.

Miss L. Fildes continues to receive a whole-time grant for her work at Cambridge on mental defect. Investigations during the year have been directed mainly towards the study of those aspects of deficiency not primarily concerned with an actual lowering of intelligence, that is, towards impulsive and emotional mental factors.

Dr. G. W. Pailthorpe, with the permission of the Prison Commissioners, has continued her studies of the psychology, health, and antecedents of women offenders in Holloway Prison. Dr. Philip Cloake, now working in Birmingham, is making an attempt to analyse the lethargic state and to show how this determines many of the mental sequelæ of encephalitis lethargica, while Dr. David Slight, at the University of Edinburgh, is studying the nature of the psychogalvanic response and its use in the investigation of cases of mental disorder. The results gained from experimental work seem to confirm the belief that the response is essentially due to a change in the skin. Under the direction of Dr. F. Golla, at the Maudsley Hospital, London, Dr. Isabella M. Robertson has been investigating blood change in some conditions of insanity. In the research laboratory established under the direction of Sir Frederick Mott by the City and University of Birmingham, further studies have been made of the basal metabolism of mental patients, and upon variations in the iodine content of the thyroid gland and their possible correlation with mental and bodily conditions.

Tuberculosis.

Work on the value of different oils in the treatment of tuberculosis is being continued by Dr. A. Stanley Griffiths. It has been found that animal oils are more germicidal than vegetable oils, and that the germicidal power of oils is increased by exposure to the sun's rays. Dr. A. C. Inman has made a series of further observations on the complement-fixation test, which bear out his previous conclusion that the test, when positive, is not an index of the activity of tuberculosis.

Preparations of sanocrysin received for testing purposes from Prof. Mollgaard were issued by the

Council for trial to the heads of university clinics in London, Edinburgh, and Cardiff, who are not engaged in private practice. An opinion, perhaps the only opinion, found to be common to the preliminary reports from all the observers was that the drug does exert a specific action on tuberculous tissues. Further clinical trials at other centres have been instituted, and are still in progress. Efforts made by Prof. S. Lyle Cummins to cure rabbits after virulent infection with bovine tubercle bacilli by subsequent treatment with sanocrysin have, so far, failed; nor has it been possible to reproduce in infected rabbits the phenomena of "shock" observed by Mollgaard in calves and by Secker and others in man. The conclusion drawn from experiments made by Sir Almroth Wright is that sanocrysin exerts no direct bactericidal effect upon the bacilli in human tuberculous lesions.

Filter-passing Viruses.

Dr. M. H. Gordon, F.R.S., in the whole-time service of the Council and working at St. Bartholomew's Hospital, London, has continued his studies of the viruses of vaccinia and variola mentioned last year. Advantage was taken of the occurrence of various outbreaks of small-pox (variola) in different parts of the country. Comparison by strict serological methods showed that the viruses from five separate epidemics all gave positive reactions with antivaccinia serum. No difference in this respect could be found between virus from the mild type of small-pox sometimes called alastrim (or variola minor) and that from severe examples of this disease (variola major). Since comparable material from six outbreaks of chicken-pox and from other control sources has been found to give completely negative results with antivaccinia serum under the same conditions, there is good reason to believe that this serological method of identifying the presence of variola virus will give valuable aid in future in the diagnosis of small-pox, if it be used.

From a study of the immunity reactions of the virus of herpes, the main conclusions formed by Dr. J. R. Perdrau were that the virus of herpes is identical with the causal agent of encephalitis lethargica. The herpetic virus was demonstrated in the brain of the only fatal cases of encephalitis lethargica available, three in number. An antibody formed in response to inoculations of the herpetic virus has been found to neutralise in vitro comparatively large doses of the virus.

As to canine distemper, the arrangements at the farm laboratories of the Council for the breeding of a clean stock of dogs for experimental purposes continue to be satisfactory, and in the meantime many investigations have been carried out. The discovery has been made that ferrets can be conveniently used for much of the experimental work, subject to ultimate confirmation of the findings in crucial experiments with dogs. The extreme infectivity of the disease has been demonstrated, and there are strong indications of the transmission of air-borne infection, at least over short distances in an enclosed space.

The Biological Actions of Light.

Prof. F. A. Lindemann, F.R.S., has accepted appointment as chairman of the committee investigating this subject in succession to the late Sir William Bayliss. Simple and accurate methods of measuring the energy of ultra-violet rays of different wave-lengths, whether in sunlight or from artificial sources, are being sought, and the therapeutic and other biological actions of light are being investigated. Dr. R. G. Bannerman, working at the Lord Mayor Treloar Hospital, Alton, is attempting to find means of measuring the clinical effects of light which might serve as a guide to the optimum dosage. Certain of his observations give fresh basis for the view that excessive dosage of light is harmful.

Anæsthetics.

It is hoped in the near future to issue a schedule of simple tests which all samples of nitrous oxide issued for anæsthetic use should satisfy. It is recorded that after much difficulty, the commercial manufacture of ethylene has been taken up in England. Investigations of propylene, butylene, and acetylene are being pursued. Dr. A. J. Copeland, investigating less dangerous substitutes for cocaine for use in producing local anæsthesia, has shown that psicaine is unlikely to be useful for this purpose. With Mr. H. E. F. Notton he reached the conclusion that ethocaine borate, or "borocaine," is in many respects the ideal surface anæsthetic, and is of very low toxicity.

The Physiology of Vision.

The Council have, after consultation with the Admiralty, the War Office, and the Air Ministry, appointed a committee to initiate and supervise researches in the physiology of vision, to coöperate with other Government departments, especially the Service departments, in studying problems involving questions of vision, and to encourage research in the subject generally. The personnel of the committee is as follows: Sir John H. Parsons, F.R.S. (chairman), Surgeon-Commander M. B. Macleod, Mr. F. C. Bartlett, Wing-Commander E. C. Clements, Major J. H. Gurley, Dr. H. Hartridge, Sir William Lister, Mr. J. W. T. Walsh, Mr. D. R. Wilson (secretary).

Dr. H. Hartridge and Mr. R. J. Lythgoe have completed a preliminary study of the effects of flicker on visual acuity and on peripheral perception of movement and are studying the effects of intensities of illumination upon visual acuity. During the coming year the committee propose also to investigate the effects of glare, and to initiate researches into the perception of movement, and the effects of fine industrial work on the eyesight. Miss Ida Mann is inquiring into the development and structure of the human lens with a view to explaining the phenomena observed by recent workers with the Gullstrand slit-lamp.

Experimental Epidemiology.

In a first report upon the results gained in the study of long-continued experimental epidemics, by Prof. W. W. C. Topley and Dr. Major Greenwood, the data of experimental epidemics of pasteurellosis in mice, lasting for more than three years, are analysed and discussed. It has been shown that pasteurellosis will continue as a fatal infectious disease within a herd of mice for an indefinite period, exceeding at least three and a quarter years, or more than a complete generation speaking in terms of the normal lifetime of the mouse, on the sole condition that the population at risk is replenished by susceptible but non-infected animals. It is not true, so far at least as the animal and the infective organism studied are in question, that an infectious disease can be brought to a standstill in an infected community even by rigorous exclusion of infected immigrants. It is suggested that serious attempts should be made to find whether the observable data of herd sickness, naturally occurring in domestic or farm animals as well as in man, confirm or refute the teaching of this investigation. It is suggested further that this experimental work may give new guidance in the study and in the practical control of natural epidemics.

POST-GRADUATE COURSES IN BERLIN.—A series of international post-graduate courses is to be held in March in which the medical faculty of the University of Berlin will participate. The arrangements include courses in all the departments of medicine, particularly those of special interest at present: a two-weekly course on diagnostic and therapeutic technique, with practical work; a two weeks' course of clinical lectures in medicine; a one week's course on nervous diseases; a two weeks' course on the diseases of children; and a post-graduate course for ear, nose, and throat specialists. Further information can be obtained from the office of the International Post-Graduate Courses, Berlin, N.W. 6, Kaiserin Friedrich-Haus für das Ärztliche Fortbildungswesen, Luisenplatz 2/4.

EDUCATION OF MYOPIC CHILDREN.

REPORT BY THE COUNCIL OF BRITISH OPHTHALMOLOGISTS.

THE Council of British Ophthalmologists, which is a central standing committee of ophthalmological societies in the United Kingdom, has just issued a report [1] on the methods adopted in various parts of the British Isles for the education of children suffering from defective vision due to myopia or other causes (excluding the blind). For the purpose of this inquiry the Council has appointed Mr. M. S. Mayou (chairman), Dr. W. A. Anderson, Mr. N. Bishop Harman, Mr. R. Beatson Hird, Dr. J. Kerr, Mr. G. H. Pooley, Dr. W. E. F. Thomson, Mr. C. H. Walker, and Mr. F. A. Williamson-Noble, with the President, Mr. E. Treacher Collins, and the hon. secretary, Mr. W. H. McMullen, ex-officio. Excluded from consideration were children who, on reaching adult life, would probably be economically blind, that is, "unable to do work for which sight is essential," for in the opinion of the Council such children should be educated in schools for the blind.

Special Educational Facilities.

The Council considers that special educational facilities are required for those who have defective vision, and for whom the ordinary school education is unsuitable—e.g., cases of progressive myopia, defective vision due to corneal opacities, congenital abnormalities. Classes which give the required facilities exist, and are termed by the Board of Education "schools for the partially blind." The Council thinks that this term is undesirable; it gives offence to parents, and may leave a stigma detrimental to the child in after life. The term "myope class" is already in use, and connotes the purpose for which this form of education is designed. Such classes were established by the London Educational Authority in 1908. It has been found that the best interests of these children are served if such classes are held in association with elementary schools, because the oral teaching and physical exercises given in the ordinary classes are available for the children. By this system association is fostered between the defective-sighted and normal children. As the children in these classes are of various ages and educational standards individual teaching is essential, and therefore it has been found advisable to limit the number of children in each class. The system of teaching by means of "myope classes" may seem to limit education so far as high scholastic attainment is concerned, but it has been found undesirable to encourage these children to follow a higher education, with the prospect of a sedentary occupation, thus incurring grave risks of serious breakdown later in life.

Existing Accommodation.

The Council has been informed that in London there are now 41 "myope classes" providing accommodation for 915 children. In the rest of England, according to the latest information available (Report of Board of Education, 1924, list 42), there are four "myope schools," and provision for other defective-sighted children is made in special classes and in schools for the blind. With a view to obtaining further information a questionnaire was sent to ophthalmic surgeons practising in 76 areas of England, Scotland, and Wales, excluding London, with the following results:—

Question 1.—Are the school-children under the educational authorities of your district examined with regard to visual acuity, and those with defective sight systematically examined and treated by spectacles (when required) by a qualified ophthalmic surgeon?—*Results:* All children are examined with regard to visual acuity. In nine areas no treatment is provided; in all others spectacles are ordered by an ophthalmic surgeon when required.

Question 2.—The number of special schools for children with defective vision.—*Results:* Sixteen such schools or classes exist in nine areas.

Question 3.—The number of classes for these children attached to (*a*) blind institutions, (*b*) ordinary elementary schools.—*Results:* Seven are located in blind institutions. Nine are some form of special class or school. No special school or class is provided in 67 areas.

Question 4.—In country districts where there are not sufficient children to form a "myope class," is any provision made for their education?—*Results:* In one area the children are sent to special educational centres. In two areas teachers are trained in the principles involved in the education o myopes, and special desks, with blackboards attached, are provided. In one area special instruction is given to head teachers. In one area all children with high or increasing myopia are restricted in their work, the most seriously affected cases being excused school for varying periods, the teachers being advised about the kind of work which is suitable for them on their return.

The Council realises that the inquiry has not been exhaustive, but considers that it demonstrates that, with a few notable exceptions, the provision for the education of the affected children is seriously inadequate. It is obvious that in country districts where the number of defective-sighted children is insufficient to form special classes some provision should be made either to send them to one of those classes in the nearest town or for their teachers to receive instruction in their management.

The Council strongly endorses the recommendation of the Departmental Committee on the Causes and Prevention of Blindness "that further provision should be made by education authorities for the education in myope classes or by similar methods for children with serious defects of vision requiring such facilities, and that steps should be taken to discover these cases at such an early age as will allow of preventive measures being adopted."

Recommendations.

The report concludes with the following recommendations of the Council:—

(1) Children with defective sight should be examined periodically by an ophthalmic surgeon, who should prescribe the necessary treatment and educational régime.

(2) In all large centres of population special classes should be established for children with such defective sight as renders them unsuitable for ordinary school education. These classes should be associated with the ordinary elementary schools, and limited to a nominal roll of 20 children to each class.

(3) In country districts where there are not sufficient children to form a "myope class," instruction should be given to teachers and parents on the education and management of children with defective sight. Instructions for teachers and parents are contained in three pamphlets issued by the London County Council: (*a*) Hints for teachers of myope classes; (*b*) memorandum containing advice to parents of short-sighted children who have been recommended for admission to a myope class; (*c*) teaching of children recommended by the medical officer for "easy treatment," "oral teaching only," or to "sit in the front row." Parents and local care committees should, it is added, receive advice as to the choice of occupation for the children on leaving school.

[1] Obtainable from the Hon. Sec. of the Council, 86, Brook-street, London, W. 1. 6*d*.

ROYAL SOCIETY OF MEDICINE: HONORARY FELLOWSHIPS.—At the last general meeting of the Fellows of the Society the following were elected to Honorary Fellowship: Sir David Bruce, K.C.B., F.R.S., Sir Henry Morris, Bart., Dr. Fritz de Quervain (Professor of Surgery, and Director of the Surgical Clinic, University of Berne), Prof. Camillo Golgi (Emeritus Professor of Histology, Royal University of Pavia), Geheim Med. Rat. Prof. Dr. Karl F. J. Sudhoff (Professor of the History of Medicine, University of Leipzig), Dr. William James Mayo (Surgeon and Chief of Staff, the Mayo Clinic, Rochester, Minn., U.S.A.), and Dr. Charles Horace Mayo (Professor of Surgery, University of Minnesota, and the Mayo Clinic). Prof. Golgi's death was announced shortly after the meeting.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The Cultivation of Babies.

ON account of his status as oldest member—he was born in 1844—Prof. Pinard again presided at the reassembly of the Chamber of Deputies. As a political representative he has never forgotten that he is primarily an obstetrician and a *puériculteur*, and in his address on the promised social reforms he did not fail to draw attention to those points which he considers vital—namely, the improvement of the French birth-rate both in quantity and quality and the reduction of infantile mortality. "And it must not be forgotten," he said, "that everything which separates a child from its mother makes it suffer—nay, more, endangers its life. Yet every year in Paris nearly 10,000 children are removed from their mothers only a few days after birth. In 1925 9349 children were put to nurse outside Paris. Is there anything more urgent than to rid our country at once of this social disgrace?"

The diminution in the French birth-rate, aggravated greatly during the middle period of the war, is now being reflected among children who have arrived at school age. In Paris the diminution in the number of children of the primary school grades is so obvious that it has been found necessary to reduce the teaching staff by 700. A serious effort is, however, being made to reduce infantile mortality. As an illustration may be mentioned a poster now displayed with official encouragement in bakeries and elsewhere which reads: "Mothers and Expectant Mothers! Do not forget that sickness and death among children are often due to parental ignorance. For securing normal development of your children, you should have them regularly examined by your physician. If you are unable to pay for such medical service, the free clinics and consultations are at your disposal."

The Oculo-Cardiac Reflex.

Compression of the eyeball normally produces a slowing of 5–13 beats per minute in the cardiac rhythm, but this slowing is said not to occur in locomotor ataxia. The reflex is of some value, but may be obscured or rendered variable and inexact by failure to observe correct technique in eliciting and recording it. Largeau and Laignel-Lavastine have recently pointed out this source of error. They employ only digital compression, using the pulp of the thumbs. Compression should not be continued for more than 20 seconds, but the pulse should be noted for about a minute after compression has ceased, in order to detect variations which may still occur. Strict attention to this technique assures, according to the authors, uniformity in results, as proved by graphic registration made in a number of tests.

Toxic Foods at the Halles.

Investigation of 24 cases of food poisoning in Paris in 1923 has shown that the causal organisms were all of the *suipestifer* (Salmonella) group, and that the infection was conveyed by contaminated cream and eggs. At the Halles, or great central market of Paris, food is supposed to be inspected, but this inspection service is really insufficient. A goodly proportion of food, moreover, is distributed in Paris without entry at the Halles. In 1922 30,000 cases of eggs escaped inspection. It has been found that dangerous infection is especially conveyed through the soiling often present on the shells of eggs.

Success of Tuberculosis Stamp Sale.

The Christmas stamp sale of 10-centime tuberculosis stamps, tried in the Department of Meurthe-et Moselle by the French National Committee of Defence against Tuberculosis, has proved an immense success. More than 3 millions of the stamps sold secured the sum of about 300,000 francs to be devoted to anti-tuberculosis work in France. Henceforth the stamp sale will be conducted throughout France.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Workmen's Compensation.

Mr. T. Hennessy, medical secretary of the Irish Medical Committee, has been giving interesting evidence before the departmental committee which is investigating the question of workmen's compensation. Dealing with treatment, he said that many injuries were inadequately treated owing to the want of facilities in every district. A medical practitioner of ordinary skill could not be considered to have the necessary knowledge to treat certain injuries by massage and electricity. Mr. Hennessy advocated training for workmen permanently disabled. Use might be made of institutions set up by the Ministry of Pensions, but no attempt should be made to dispense with the patient's own doctor. He recommended that disputes due to conflicting medical evidence should not be heard in open court, but should be submitted to a State medical referee, with a right of appeal to a board of medical referees. The State medical referee should be available for consultation if required by the injured person's doctor. He should also have power to enforce treatment after consultation with the injured person's own doctor, and to reduce benefit if treatment was refused. A medical assessor would not be necessary if this procedure were adopted, but should present arrangements hold, whereby disputed cases were heard in open court, then the medical assessor should be summoned in all cases where medical evidence was to be taken. The judge should not have the option of saying whether or not the medical assessor should be present. Mr. Hennessy believes that the difficulties of establishing a percentage scale of incapacity are very great, though the adoption of such a scheme might be possible in such specific instances as the loss of an eye or total or partial loss of a limb.

At a subsequent session of the departmental committee Dr. G. Pugin Meldon, certifying surgeon for Dublin City, suggested that there should be a probationary period for the medical examination of persons between the ages of 14 and 16, as it often happened that poor children who were badly housed and fed showed much improvement after being at work for some time. He inspected factories and examined all young people between 14 and 16, and his duty was to satisfy himself that they were suitable for the work they were doing and the work they would have to do later on. At present he had no power to re-examine them. He had also to decide that the work was suitable, and that they were not likely to be a source of danger or infection to other workers. All big factories had now first-aid squads amongst their workers, and he thought that every factory, no matter how small, should have a first-aid case, and that some of the workers should be taught the principles of first-aid.

Proposal for a State Medical Service.

Prof. M. G. O'Malley, professor of surgery in University College, Galway, delivered a lecture recently before the Chamber of Commerce of Galway, in which he urged the establishment of a State medical service. He suggested that entrance to the service should be by competitive examination, and that the successful candidates should be graded according to their suitability. There should be compulsory retirement at the age of 65 and all members of the service should be whole-time officers. The hospitals should be under State control. Mr. O'Malley looked to "a gigantic scheme of insurance" to finance the scheme.

Experience for County Medical Officers.

As has already been indicated in THE LANCET,[1] the Local Government Act, 1925, lays down that every county shall appoint district medical officers of health who must hold the D.P.H. or some corresponding degree. With a view to promoting the training of candidates with special knowledge the Rockefeller Foundation is sending three men to the U.S.A. to familiarise themselves with the latest developments of public health procedure there. It has been recognised that the position of the existing tuberculosis officers holding the D.P.H. is entitled to special consideration, and arrangements have been made with the Society of Medical Officers of Health to enable such officers seeking appointment as county medical officers to acquire further administrative experience. The society has selected suitable county areas where Irish medical officers can acquire experience of English methods of health administration, and the following nominees of the Department of Local Government and Public Health of the Irish Free State, who have been granted travelling Fellowships by the International Health Board of the Rockefeller Foundation, have already been attached to county health departments in England: Dr. Thomas Reynolds (Leitrim) to Shropshire; Dr. J. J. Dennehy (Waterford) to West Suffolk; Dr. T. P. O'Reilly (Cavan) to East Sussex; Dr. B. O'Beirne (Galway) to Lindsey (Lincs.); Dr. P. J. Burke (Sligo) to Wiltshire; and Dr. J. J. O'Connell (Tipperary) to Buckinghamshire. In addition to these official nominees Dr. G. Fitzgerald, of Tralee, has been attached to the East Berks U.S.D., and Dr. D. J. O'Regan (King's County) will shortly be attached to the West Sussex health department.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Capt. T. T. Jeans is placed on the Retd. List with rank of Surg. Rear-Admiral.

Surg.-Comdr. E. A. G. Wilkinson is placed on the Retd. List with rank of Surg.-Capt.

Surg. Lt.-Comdr. J. D. Bangay to be Surg.-Comdr.

D. Bell to be Surg.-Lt.

Surg.-Comdrs. F. L. Smith and R. H. McGiffen to *President*, addl., for the Medical Department of the Admiralty. W. H. Murray, to *Victory*, addl., for R.N. Hosp., Haslar, for specialist duties; G. R. McCowen and E. Moxon-Browne, to *President*, addl., for three months' post-graduate course.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg.-Comdr. A. D. Cowburn is placed on the Retd. List with the rank of Surg.-Capt.

ROYAL ARMY MEDICAL CORPS.

ARMY RESERVE OF OFFICERS.

Lt. I. S. Thomson, late R.A.M.C., Def. Force, to be Lt.

MILITIA.

Maj. J. C. Hall retires on attaining the age limit and retains the rank of Maj.

TERRITORIAL ARMY.

Maj. R. G. Badenoch resigns his commission and retains his rank.

Capt. J. C. Andrews (late 9th Lond. R.) to be Lt. and relinquishes the rank of Capt.

Lt. R. S. Creed (late R.H.A., T.A.) to be Lt.

J. Cook to be Lt.

2nd Lt. E. J. P. McDowell (late R. Fus.) to be Lt.

Sanitary Companies.—F. W. Bury to be Lt.

ROYAL AIR FORCE.

J. Magner is granted a short service commission as a Flying Officer for three years on the active list.

West African Medical Staff.—Dr. D. Duff, Medical Officer, Gold Coast, has been promoted to be a senior medical officer in that Colony in succession to Dr. H. W. Gush.

[1] THE LANCET, Jan. 2nd, p. 42.

Public Health Services.

A PUBLIC MEDICAL SERVICE FOR LONDON.

COMPULSORY insurance at present by no means covers the medical needs of the poorer section of the community, for there is still a large class above the Poor-law level and yet unable to pay ordinary medical fees. Mainly the dependants of insured persons, they include also the families of those who do not come within the scope of the Insurance Acts. In some parts of the country these classes are provided for by clubs on contract lines or by provident dispensaries of various kinds. It is the persistent attempt in some places to perpetuate club practice in its less desirable forms, and the real demand in other places for medical attendance on a contract basis, as well as the delay in extending medical benefit to the dependants of insured persons, which accounts for the initiation of public medical services which are becoming quite common. The public medical service for London, projected by the Local Medical Committee, appears to be on the usual lines. It is based on voluntary contributions, the public are canvassed by salaried officers called collectors, who will enrol members and collect subscriptions of 3*d.* a head each week. The subscribers become eligible for treatment a fortnight after being enrolled. The services available are roughly the same as those under the medical benefit provision of the National Insurance scheme. Confinements and special services are excluded. Medicine is provided by the practitioners. There is an income limit of £250. Administrative expenses are to be met by an entrance fee of 1*s.*, and a quarterly charge of 9*d.* per member. In other words, 3*s.* out of the capitation fee of 13*s.* goes to the administration account. The scheme as set out will provide a basis for the extension of the medical benefit to dependants of insured persons, and will meet the demand on the part of friendly societies and others for contract service to the families of their members. Incidentally it will remove from London practitioners any temptation to take on cheap contract work. Whether the scheme as devised will meet these contingencies must depend upon the enthusiasm with which it is taken up. Its financial basis is voluntary, and success will wait on the ability of the collectors to persuade potential subscribers of the advantages to be gained by joining the service. The Essex scheme, run on similar lines, has certainly made good in the first two years of its existence. From the professional point of view, although the scheme may be a paying proposition, it will necessarily increase the work of the already busy practitioner. The experience of societies, such as the temperance organisations which have always had sections for children, shows that dependants are the most exacting members. To take over dispensing, as is suggested in the scheme, would further add to the work of the doctors. There is no reason to doubt that the coöperation of the chemists could be secured in providing medicines on lines similar to those of the insurance service. The projected service should then prove a boon to a large class of people who cannot pay doctors' bills, and who at present crowd the out-patient departments of our hospitals. The 300 or more practitioners who attended the recent meeting at the B.M.A. House appear to be keen on it. It remains to be seen whether the London public will realise the advantages of voluntary insurance sufficiently to join in adequate numbers.

A GROWING SPECIALIST SERVICE.

In a report which has just appeared Dr. J. Middleton Martin states that increasing use is being made of the opportunities offered in Gloucestershire for treatment under the "Scheme for the Extension of Medical Services," and that the county council have been encouraged to enlarge its range. The advantages of the out-stations for the examination of children who live at long distances from the general hospital are

being more and more appreciated. Arrangements have now been entered into with the Chepstow hospital and the cottage hospitals at Fairford and Winchcombe, and work will soon be begun at the new out-station at Soundwell. A table shows that during the last four years the work has increased in all directions, thus diminishing the average total cost per attendance. In 1921 the total cost per attendance was £1 13*s.* 6*d.*, the cost per case of specialist's services £1 18*s.* 6*d.*, the cost of medical officers per attendance 5*s.* 6½*d.* In 1924 the three items mentioned were reduced to 6*s.* 10½*d.*, 9*s.* 6½*d.*, and 1*s.* 11*d.* respectively; and it is expected that as the scheme develops there will be a further reduction. Requests for the opening of more out-stations have been received. The orthopædic service has been begun and will shortly be extended. Other services of almost any kind can be grafted on the scheme. The whole area of the county can be covered by the opening of 11 further out-stations in more or less populated areas and by the use of about 13 doctors' surgeries in the more sparsely populated parts of the county. The estimated capital expenditure for 1925 is between £6000 and £8000. The total maintenance expenditure for 1925 is £5650 and only exceeds the figure for 1924 by two-thirds, though it makes provision for an area more than twice as large. This last-named maintenance figure "works out at 2*d.* per head of the population in respect of rates per annum." The following are the details of the specialist services during the four years 1921–24: visits, 12, 45, 63, 80; cases seen 179, 705, 1091, 1485; operations 56, 159, 312, 412. There is therefore every indication of steady progress.

THE CONTROL OF FOOD AND DRUGS.

The report of the Salford public analyst, Mr. G. D. Elsdon, shows that there is at any rate one sanitary authority which administers with energy the Sale of Food and Drugs Acts. In proportion to the population the number of samples taken in Salford is high. Competition among food manufacturers is constantly bringing up new points, and Mr. Elsdon is of opinion that it is unfair for the local sanitary authority to be saddled with the cost of litigation to settle points which are of national importance. Many local authorities, he says, refrain from taking action, not because they think action in a particular case is undesirable, but because they are not prepared to face the possibility of protracted legal proceedings. To take a case to the House of Lords at a cost of £5000 would involve Salford in the equivalent of a 1*d.* rate. Mr. Elsdon thinks there should be some machinery by which the cost of necessary and desirable prosecutions should not fall entirely upon one local authority. The substance in the 1924 report which calls forth this suggestion is lemon cheese, and some of the facts given about this substance will serve to illustrate Mr. Elsdon's case. According to all cookery books lemon cheese should consist of sugar, butter, eggs, lemon-juice and rind, in the (approximate percentage) proportion of 54, 11, 25, and 10 respectively. Some manufacturers still make lemon cheese of this composition, while others sell cheap substitutes containing no eggs, but margarine, glucose, tartaric acid, &c. The defence is that the public would not buy an article if it were not palatable, but Mr. Elsdon's question is: Are manufacturers at liberty to describe an article by the name of some other article, merely because the flavours are similar and because the inferior substitute is not actively injurious to health? A good example is given of a shop-keeper who once had a large trade in lemon cheese made by herself according to a formula of Mrs. Beeton and labelled "home made." She now sells one of the cheaper substitutes which she purchases from a manufacturer, but still continues to label it "home made." Other points brought out in Mr. Elsdon's report are as follows:—

1. If a Salford milk purveyor collects his milk by motor from a Cheshire farm, the Salford authority has no power to take samples at the place of delivery.

2. Owing to the decision in Anness *v.* Grivell, margarine may still be sold under a fancy name. Thus the Salford authority took proceedings with regard to a sample described as margarine blended with butter which only contained ½ per cent. of butter fat. According to Section 8 of 1899 Act margarine may contain as much as 10 per cent. of butter but is still margarine. The decision in the case of Anness *v.* Grivell has therefore had an extraordinary effect.

3. Six out of 55 samples of Cheshire cheese were found to be adulterated, and Mr. Elsdon thinks it is probable that cheese imported from Holland and made from half-cream and three-quarter cream milk is sold as "Cheshire" cheese.

4. Eleven samples of diabetic foods were examined and contained in some cases over 60 per cent. of starch. A prosecution would probably have failed, because a booklet containing analyses was supplied at the time of sale. A diabetic flour of which the analysis corresponded almost entirely with an ordinary wheat flour was sold at 7*s.* 6*d.* for a bag containing 6 lb.

5. Peach-kernel oil was sold for almond oil in five cases out of 34.

6. Six out of 12 cases of paregoric contained no opium.

7. One sample labelled "blended turpentine excellent for household cleaning purposes, &c.," contained not more than 5 per cent. of turpentine.

It is gratifying to read in Mr. Elsdon's report that there is a great improvement in the efficiency of the dispensing service under the Insurance Acts, and that the use of arsenic in the ink of paper used for food wrapping has been discontinued. Throughout his report Mr. Elsdon stresses the fact that the Food Manufacturers' Federation, and reputable food manufacturers generally, wish to do the right thing, although there may be a difference of opinion as to what is the right thing. Better results might be obtained if a central authority such as the Food Commission had the whole matter entrusted to them and endeavoured in the first instance by coöperation with the traders concerned to come to some understanding as to the standards which should be adopted. The admittedly high standard reached in the American canned-meat trade may fairly be attributed to coöperation between the Government and the trading associations.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 16TH, 1926.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 341 (last week 255); scarlet fever, 1717; diphtheria, 994; enteric fever, 24; pneumonia, 1337 (last week 1761); puerperal fever, 63; cerebro-spinal fever, 6; acute poliomyelitis, 3; acute polio-encephalitis, 2; encephalitis lethargica, 67; dysentery, 5; ophthalmia neonatorum, 122. There were no cases of cholera, plague, or typhus notified during the week.

Of the 341 cases of small-pox, 60 (last week 25) were reported from the county of Derby, 57 of them from Derby C.B.; 143 (last week 140) from the county of Durham, 12 of these from Gateshead C.B., 4 from South Shields C.B., and 1 from Sunderland C.B., the large remainder widely scattered over urban and rural districts; 21 from the county of Northumberland; 16 from the county of Nottingham, 11 of these from Sutton-in-Ashfield; 2 from the county of Stafford (Stoke-on-Trent C.B.)—a new focus; 9 from the East Riding of Yorkshire (Kingston-upon-Hull); and 90 from the West Riding, 77 of which (last week 58) occurred in Rawmarsh.

Deaths.—In the aggregate of great towns, including London there were no deaths from enteric fever (an unusual and very gratifying event), none from small-pox, 94 (58) from measles, 14 (1) from scarlet fever, 59 (4) from whooping-cough, 31 (9) from diphtheria, 51 (18) from diarrhœa and enteritis under 2 years of age, and 81 (16) from influenza. The figures in parentheses give the numbers for London itself. The number of deaths from influenza is still diminishing, the figures for the last three weeks, working backwards, being 81, 114, 123.

NEW WHITEHAVEN HOSPITAL.—Princess Mary Viscountess Lascelles, accompanied by Lord Lascelles and Lord Lonsdale, opened the new Whitehaven and West Cumberland Infirmary on Jan. 22nd. Formerly the building was Whitehaven Castle, the seat of the Lowther family since the seventeenth century. It was purchased five years ago from the Lonsdale trustees and presented by an anonymous donor to the governors of the old infirmary for conversion into a modern hospital. In addition to this gift the donor gave £20,000 towards the necessary alterations, which cost £50,000.

Correspondence.

"Audi alteram partem."

THE STATUS OF THE CLINICAL PATHOLOGIST.

To the Editor of THE LANCET.

SIR,—The thanks of the private pathologist are due to you for your championship of his rights in the leading article on the County Pathological Service (THE LANCET, Jan. 16th). The progress of research in clinical pathology has opened up fresh fields of inquiry in the matter of diagnosis and treatment of disease, and a large number of medical men have specialised in this branch during the past 20 years. As the demand increased various institutions were established, and now this kind of work is being catered for by public health authorities, pathological departments of medical schools and hospitals, combinations or companies under the control of medical men, and business firms who employ qualified medical men. We are in a transition period, and as the demands for the pathologist's services increase year by year, some form of unification of centres will have to be made. But this centralisation may take a long time to establish, and in the meantime, in order to keep up and increase the standard of knowledge required of pathologists, their interests must be safeguarded. Otherwise the class of men and women entering this field of medicine will deteriorate. It cannot be expected that the best men and women will specialise in pathology if the prospect held out to them is only that of laboratory workers with a fixed salary and little, if any, chance of obtaining clinical experience. Whatever method of centralisation is established in the future, I hope the necessity of combining clinical medicine with pathology will be kept in the foreground, for the very essence of progress and advancement in pathological knowledge depends upon this combination.

I am, Sir, yours faithfully,

Jan. 20th, 1926. E. H. SHAW.

HEDONAL ANÆSTHESIA.

To the Editor of THE LANCET.

SIR,—In a paper in THE LANCET of Jan. 16th Dr. R. K. Lambert suggests, as a result of experiments on animals, that some of the aliphatic non-volatile compounds might be used as a preliminary to general anæsthesia, and more particularly he mentions a mixture of isopral and hedonal. For the last six months I have been using hedonal in this sense, given by the rectum about one hour before operation. The solution I use is 100 gr. of hedonal in 5 oz. of 33 per cent. alcohol. The enema is given by the nurse and in 15 minutes the patient is in a sound sleep and is quite unconscious of anything until some six hours after the operation is over. He remains asleep during transit to and from the theatre and knows nothing of the administration of the general anæsthetic, whatever it may be. Usually it is quite sufficient to give gas and oxygen. I have performed gastrectomy, colectomy, hysterectomy, and gall-bladder operations under this combination of anæsthetics, and have found the muscular relaxation greater than with the ordinary preliminary injection of morphia, &c., and subsequent ether. This relaxation is so marked a feature that I think the hedonal must have some special effect on the somatic, or more probably on the sympathetic, innervation of muscles.

I have taken blood-pressure readings during operation, and because hedonal belongs to the urea series, I have made blood-urea estimations before and after operation, but neither of these has been found to follow any course differing from what is seen under the usual conditions of anæsthesia. My observations do not quite coincide with those of Dr. Lambert on animals, for I find that given by rectum there is only a very short period—namely, 15 minutes—before the patient is asleep. As might be expected, the effects are not quite uniform. In the human subject, for example, a big man requires more than a thin, wasted one, and though most of the patients sleep on for several hours after operation and need (or rather receive) careful attention to ensure that pressure sores shall not arise, others have been found to be unusually restive. I think this is merely a question of learning the right dose for the type of patient. Pulmonary complications are, if anything, less frequently seen than after the ordinary method of anæsthesia. Occasionally the patients have a few hours of inefficiency of the anal sphincter, which may render the giving of continuous rectal fluid impossible, but this soon passes off.

I should hesitate to give hedonal when the kidneys and liver are known to be functioning deficiently, but I do not know that it increases the risk in these conditions over the more usual methods. All my patients have expressed great satisfaction with the merciful unconsciousness of the pre-operative affairs, and from the surgeon's point of view the remarkable relaxation of muscles in abdominal operations is a great convenience. I think that post-operative flatulence is less evident, too, but I am not sure about this; it might be expected, however, as handling can be more gentle if the surgeon is unhampered by stiff muscles.

I am, Sir, yours faithfully,

Leeds, Jan. 20th, 1926. E. R. FLINT.

DETERMINATION OF THE BASAL METABOLIC RATE.

To the Editor of THE LANCET.

SIR,—The interesting article by Mr. T. C. Hunt on the above subject in your last issue induces me to mention a very simple but not very accurate method which I have long employed. The determination of the basal metabolism has been chiefly employed in hyperthyroidism, and in this affection accuracy is not of much importance as a guide to treatment. Moreover, all the methods for determining the excretion of carbonic acid and the absorption of oxygen are very complicated and liable to many errors. I make the patient take two or three deep breaths to get rid of any excess of carbonic acid in the alveoli and then suspend the breathing in inspiration or expiration. When a patient who has fairly normal lungs can hold his breath for 30 or 40 seconds you can safely conclude that there is no excessive basal metabolism. I think the estimation of the excretion of the nitrogenous waste products through the kidneys is of more importance than that of the carbonic acid through the lungs.

I am, Sir, yours faithfully,

Liverpool, Jan. 25th, 1926. JAMES BARR.

GLYCOSURIA AND LIFE ASSURANCE.

To the Editor of THE LANCET.

SIR,—Dr. Arthur Davies states that it is no part of the duty of the assurance company to spend time and incur expense, even with the applicants' approbation, on special examinations for determining the prognosis in cases of glycosuria. Surely this is a matter to be decided in each individual case. The benefits of assurance are derived not only by the policy-holders but also by the companies, and the latter often risk losing remunerative business by the rejection of glycosuric cases on insufficient evidence. The important point would appear to be that both the proposer and the company should know that more precise information may allow of acceptance, after which the extent of the sum to be involved under the policy will probably determine in whose interest it will be to pay the necessary costs of the laboratory examination.

I am, Sir, yours faithfully,

Harley-street, W., Jan. 24th, 1926. T. IZOD BENNETT.

IGNITION OF ETHER AT LOW TEMPERATURES.

To the Editor of THE LANCET.

SIR,—The Joint Anæsthetics Committee of the Medical Research Council and the Royal Society of Medicine recently learnt from Prof. H. B. Dixon, F.R.S., that mixtures of ether vapour and oxygen would ignite at relatively low temperatures. Arrangements are being made for Prof. Dixon to carry out further researches into the ignition temperatures of various anæsthetic gases. but in view of the fatal accident which occurred in London some months ago, the Committee does not feel justified in delaying publication until this work is completed. Prof. Dixon has therefore sent me a preliminary report which I am instructed to make public.

It should be understood that this Committee does not wish to give an opinion as to the actual cause of the particular fatal accident referred to as it is without sufficient detailed information to warrant such a course. It must, however, be admitted that the metal tube of a dental dressing syringe used for drying purposes might easily be at a temperature above the danger point (200° C.) without such a possibility occurring to the mind of an operator unacquainted with the facts given below.

I am, Sir, yours faithfully,

CHARLES F. HADFIELD, M.D.,
Hon. Sec., Anæsthetics Committee.

London, W., Jan. 20th, 1926.

[The following passages are taken from Prof. Dixon's report to which Dr. Hadfield refers:—

"May I take the opportunity of urging the desirability, in the public interest, of issuing some warning as to the high inflammability of mixtures of ether with oxygen? It is curious how little information is given in text-books on the temperatures at which gases inflame, and there are some puzzling discrepancies between results that have been published in scientific journals. . . .

I have tested ether vapour by bringing it into heated oxygen through a silica tube equally heated, and have found a delayed ignition at 220° C. (428° F.)—a figure I believe to be too high (as a minimum ignition-point) rather than too low. Other observers have put the ignition-point of ether in oxygen as low as 190° C. (374° F.). A peculiar difficulty exists in the determination of the ignition-point of ether mixtures, because the vapour itself decomposes rather rapidly in contact with heated surfaces, and secondly, because the mixture may undergo a partial combustion with an almost invisible flame, and this may develop into the normal luminous combustion. The late Sir William Perkin found that ether vapour began to show this incomplete burning in air at 260° C., and Mr. A. G. White, of Messrs. Nobel's Explosives Co., has observed a "cool flame" to start under certain conditions below 190° C. Now the normal ignition of the most inflammable mixture of ether and air has been found by several observers to occur about 360° C.—the ignition not being violent. But ether and oxygen form highly explosive mixtures in which the detonation-wave may be rapidly set up once the flame is started. The lowest ignition-point of such ether-oxygen mixtures has yet to be determined precisely, but it is obvious that there is a special danger in bringing a heated body in contact with such mixtures. That the heated body is not visible red-hot is no guarantee of safety; the danger-point begins at least 300° C. below visible redness."]

"DAILY MAIL" HOSPITAL BALLOT.

To the Editor of THE LANCET.

SIR,—In your issue of Jan. 2nd you report that the British Charities Association, of which I happen to be president, "allocated last year £15,000 and this year £20,000 to the London Hospital." No such luck! though I have little doubt that you will yourselves make up for the printer's error. The B.C.A makes no grants direct to any London hospital. The money allocated to London hospitals—note the "s"—is paid to the King's Fund, who distribute it as they think fit.

I am, Sir, yours faithfully,

KNUTSFORD,
Chairman, London Hospital.

Jan. 22nd, 1926.

GOLD SALTS IN THE TREATMENT OF PULMONARY TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—In his contribution to the discussion on the Treatment of Pulmonary Tuberculosis with Sanocrysin at the Royal Society of Medicine on Jan. 12th, Prof. T. R. Elliott mentions (THE LANCET, Jan. 16th, p. 126) that sanocrysin is a soluble thiosulphate of sodium and gold. I should like to remind your readers that over eight years ago Mr. Henri Spahlinger, acting on the suggestion of the late Dr. Arthur Latham, used gold as well as bismuth and other mineral salts in the treatment of tuberculosis, publishing his results in the *Revue Médicale Suisse* of December, 1917. Mr. Spahlinger summed up his experience in the sentence: "So long as the doctor has not at his disposal a series of different bactericidal salts which will penetrate to the centre of the lesion, chemotherapy will be powerless to cure somewhat advanced tuberculosis."

I am, Sir, yours faithfully,

BRUCE BRUCE-PORTER.

Grosvenor-street, W., Jan. 15th, 1926.

INTRA-URETHRAL NEGATIVE PRESSURE DURING COITUS.

To the Editor of THE LANCET.

SIR,—Mr. Wansey Bayly quotes, and agrees with, Mr. Charles Gibbs's statement that "the meatus opens in the introducing movement . . . ." But is this so? I suggest *only in the absence of the frenum.* Examination of the frenum and its attachments will, I think, readily show that "the introducing movement," when engagement with the vaginal wall occurs, must exert traction on the frenum and draw tightly together the lips of the meatus, firmly closing it. There happens a close engagement of the frenum region of the penis with the vaginal wall. One proof of this is the fact that the V.D. clinic M.O. sees torn frenums noticed by the patient immediately after coitus. In a clinic for seafarers, such as the writer's, the complaint that "the bobstay has carried away" is not very rare. In no case has the patient with torn frenum admitted that the union had been with a virgin, or intromission difficult.

That the gonococcus is somehow deposited on the surface of the male urethra, remains there for a time, and spreads first along that surface, has always been nothing but a careless assumption. It receives no support from the mechanics of sexual congress as here suggested; nor from the common experience that the first few days' tingling thin discharge of an early case, though repeatedly examined with care, seldom indeed reveals any gonococci. As a rule these are found only later when the discharge has become macroscopically purulent. Were it mainly, or even at all, a surface infection, should not the bacterium be found readily from the start? Mr. Kenneth Walker has shown that in the male urethra the deeper lymphatic spread can at least outstrip the superficial original implantation.

I suggest that one thing appears as certain in gonococcal infection of the male urethra—viz., that it is from the very first an infection of the deeper lymphatics of the mucous membrane, and beyond the immediate reach of antiseptics.

I am, Sir, yours faithfully,

H. M. HANSCHELL.

Albert Dock Hospital, Connaught-road, E., Jan. 22nd, 1926.

To the Editor of THE LANCET.

SIR,—Mr. Wansey Bayly's letter is interesting to me as I have been one of those who put forward the argument that septic material is carried down the male urethra during coitus by means of a suction action (*Practitioner*, February, 1922). Mr. Bayly's comparison to the piston and cylinder is erroneous. The head

of a metallic piston is not a living organ nor is it possessed of muscular action. The *rigid* penis may resemble a piston, but fortunately a penis possesses a contractile power of its own; thus, during coitus there is the body working the piston and the piston undergoing rhythmical contractions. Female hormones are undoubtedly absorbed by the male urethra during intercourse, why not infected material?

I am, Sir, yours faithfully,

Harley-street, W., Jan. 22nd, 1926. M. W. BROWDY.

AN EASY METHOD OF PERFORMING TRACHEOTOMY.

To the Editor of THE LANCET,

SIR,—Some 15 years ago I performed tracheotomy in an adult on lines very similar to those described by Prof. Kenelm H. Digby in the LANCET of Jan. 16th. The trachea was obscured by an unusually wide thyroid isthmus which was clamped on each side with long-bladed forceps, and then divided. The operation, as stated by Prof. Digby, was simple and almost bloodless.

I am, Sir, yours faithfully,

C. HAMILTON WHITEFORD.

Plymouth, Jan. 21st, 1926.

PRIVATE NURSING HOMES.

To the Editor of THE LANCET.

SIR,—Is it not most desirable that consultants and general practitioners, before recommending patients to a private nursing home, should invariably have a good knowledge of the home, as regards the nursing staff and the food; and that patients or their relatives should make more careful inquiries on these points than is usually the case?

Pay wards in a hospital are under the control of a responsible hospital board; but private nursing homes are usually not under the control of any such responsible body. Of course, most private nursing homes are good, or fairly satisfactory; but not all. When we think of those we have loved and lost, it is most distressing to know that the last weeks of their lives were made miserable by the unkind and unsympathetic treatment of the nurses, and by the bad food in a private and expensive nursing home. Worse defects I do not desire to discuss.

I have ventured to write this letter owing to my own sad experience, and the experiences related to me by numerous reliable friends. Also it is desirable that disrespect for the medical profession should not be tolerated in any private nursing home. Recently the lady director of a large and well-known private nursing home in London calmly informed me (without any provocation) that most medical men were not straight, and were more suitable for tram-drivers than doctors, and that nurses were badly and unfairly treated by medical men. As general statements these remarks are, of course, untrue and unfair.

I was also informed at this home that patients were ungrateful. I have the diary of a patient who recently died as the result of treatment in this nursing home; and it is very painful reading indeed. I can understand that for the nursing and treatment in such a home patients cannot feel grateful.

I am, Sir, yours faithfully,

London, Jan. 26th, 1926. M.D., F.R.C.P.

*** Private nursing homes vary from the good to the inadequate and—judging from communications we have received at different times—even to the bad. It is certainly right that the doctor in charge of the case should be responsible for the diet, and his inquiries as to the possibility of the home supplying the diet ordered in proper substance and in proper manner would be accepted in well-run nursing homes as perfectly reasonable. Where a consultant is in question, the home having been selected by the doctor in charge of the case, the support of the consultant should be insisted upon. Where the consultant is responsible for the choice of the home, he should in every case listen to representations of faults, either in diet or service. We are aware of difficult and delicate situations which may arise, while we are also well aware that the stories of large profits made by private institutions have been very generally baseless. —ED. L.

ORGANOTHERAPY IN SEXUAL PERVERSION.

To the Editor of THE LANCET.

SIR,—In your annotation concerning sexual offences against young persons (THE LANCET, Jan. 2nd) you draw attention, rightly it seems, to the absence of mental defect as a cause. In this age of organotherapy it might be well to consider the possibility of other causative defect than a mental one in these cases of sexual abnormality and in other forms of sexual perversion. It is quite conceivable that deviation from the normal sexual impulses is connected with hormone lack. Two French physicians, L.-M. Pierra and A. Jouve,[1] claim to have effected good results in sexually abnormal females by spermatotherapy, injection of orchitic extract of the spermatogenic portion of the gland. If this be so, then possibly ovarian extract would have a similar effect on male perverts. The victims of abnormal sexual desires might be induced to disclose themselves were there a prospect of treatment by other than punitive methods.

I am, Sir, yours faithfully,

D. T. BARRY.

Physiological Department, University College, Cork, Jan. 19th, 1926.

PROFESSIONAL CRITICISM OF THE GENERAL MEDICAL COUNCIL.

To the Editor of THE LANCET.

SIR,—It seems to me that the present criticism of the General Medical Council in the public press at home is not due to any lack of appreciation by the public of the need of such a body to prevent the growth of abuses which would inevitably arise were the Council non-existent, but to the methods of its judgments. It is one of our national characteristics to regard with suspicion the decisions of tribunals empowered to pronounce summary judgments without appeal, and for this reason those of a professional tribunal like the General Medical Council which can to all intents and purposes determine without appeal the career of a professional colleague are particularly suspect. I have been in the habit for many years of reading the proceedings of the Council as reported in THE LANCET, and am convinced that its decisions are almost invariably both just and tempered with mercy. Nevertheless I am in agreement with the great majority of my fellow countrymen who resent the practical absence of appeal from the judgments of the Council. The General Medical Council being under the Privy Council, any practitioner struck off the Register has, it would appear, the right of appeal to the Privy Council itself. This being so I would suggest that it should be arranged that in future such appeals should be referred for consideration by the Privy Council to its Judicial Committee—that very illustrious body which is the highest court of judicature in the Empire. Were this done public opinion would be reassured and much irrelevant criticism of the Council obviated.

I am, Sir, yours faithfully,

Bengal, India, Jan. 7th, 1926. HINDUSTAN.

*** Our correspondent may not have seen a recent leading article in THE LANCET setting out the legal position. There seems no doubt that the Judicial Committee of the Privy Council would not act in the way suggested: the actual question of their doing so has been raised before.—ED. L.

[1] Journal de Médecine de Bordeaux, 1925, p. 194.

THYROID GLAND AND CALCIUM THERAPY

To the Editor of THE LANCET.

SIR,—In your issue of Jan. 9th appears a letter from Dr. D. C. Nasmyth which raises a point of great clinical importance—namely, the advisability of administering thyroid substance to individuals suffering from chilblains. Dr. Nasmyth contends that any benefit which results from such treatment is due to the contained parathyroid element, and that, in her experience, the "administration of thyroid often causes chilblains where they have not previously existed."

There is, I think, ample evidence that the salts of calcium are of great value in the treatment of chilblains, and the work of Groves and Vines showed that the parathyroid apparatus and the calcium metabolism of the body stand in close relationship. In the experiments of MacCallum and Voegtlin on the effects of calcium salts on tetany, they showed that both in animals and human beings the administration of lime salts caused the symptoms to disappear. The exhibition of calcium salts in the treatment of chilblains dates back to days before the rôle of the parathyroids was understood. It is now, in conjunction with parathyroid substance, an accepted method of treating this troublesome, if somewhat petty, complaint. That many sufferers from chilblains are also hypo-parathyroideics is probable; it is also likely that some of these individuals are lacking an adequate supply of thyroid secretion, and they would therefore benefit by thyroid feeding.

The whole question of the inter-relationship of the thyroid and parathyroid apparatus is still so undecided that, clinically, it is only possible to pick out the outstanding symptoms in an individual case and prescribe accordingly. I do not see any good grounds for objecting to the dual prescription of thyroid and parathyroid in a given case, so long as the symptoms support such a prescription. I cannot personally recall any patients who have developed chilblains for the first time after taking thyroid substance; but it is not improbable that this might occur in what may be called "potential" sufferers, if their calcium elimination was briskly stimulated.

I am, Sir, yours faithfully,

IVO GEIKIE COBB.

Queen Anne-street, W., Jan. 12th, 1926.

CHARING CROSS HOSPITAL INSTITUTE OF PATHOLOGY.

To the Editor of THE LANCET.

SIR,—In your issue of Nov. 22nd, 1924 (p. 1102), you published details of a scheme under which the Hospital for Epilepsy and Paralysis placed its pathological facilities at the disposal of general practitioners in the neighbourhood, for the benefit of those patients who could not pay private fees, and in the same issue (p. 1097) a letter signed by the pathologists of three London hospitals, of whom Dr. Alfred Piney was one, protesting against the hospital's policy. Their argument was carried on by Dr. J. A. Murray, President of the Pathological Section of the Royal Society of Medicine, and you were good enough to publish a reply from the hospital on Dec. 6th (p. 1206).

A circular dated Nov. 1st, 1925, from Charing Cross Hospital Institute of Pathology has reached me, from which it appears that this hospital's scheme, which was criticised a year before, has been in the main adopted by the Institute. In an accompanying schedule of fees the statement is made that Dr. Alfred Piney (one of the signatories of the above-mentioned letter) will sign all reports, and I venture to ask, through your columns, if Dr. Piney will state what has influenced him during the past 12 months to change his views, and whether his present opinions are shared by his co-signatories.

I am, Sir, yours faithfully,

H. W. BURLEIGH,

Secretary and General Superintendent, Hospital for Epilepsy and Paralysis.

Jan. 25th, 1926.

THE SPECIAL DIPLOMAS OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

To the Editor of THE LANCET.

SIR,—The younger generation can now obtain diplomas in otology, ophthalmology, and other subjects at the Royal College of Surgeons of England as an evidence of their competence to practise these branches of their profession as "specialists." This is a step in the right direction, but to senior men it may seem hard that, after years of hard work, they should be without such a special diploma unless they pass the necessary examination. Many men hesitate, lest failure should occur to prejudice them in the eyes of their patients. They feel that such an examination would be at the hands of their contemporaries, possibly even of their juniors, and that differences of personal opinion might hazard their success. Would it not be an expedient and graceful act if the Royal College could see its way to granting its special diplomas to those who have been practising their specialties for, say, 25 years? Of course, on payment of the necessary fee.

I am, Sir, yours faithfully,

F.R.C.S. AND SPECIALIST OF THIRTY YEARS STANDING.

Jan. 22nd, 1926.

*** Our correspondent, whose position as a specialist requires no strengthening, puts forward a view that must command sympathy, but we believe that the College would decline the responsibility suggested. The task of discrimination would be too difficult because there are no standards on which the withholding the diploma without examination from claimants to the position of specialist could be justified, at any rate, in the eyes of the disappointed. And injustice might be done unwittingly.—ED. L.

Obituary.

IRIS FOX, M.D. LOND.

WE deeply regret to record the death of Dr. Iris Fox from septicæmia. She pricked her finger at an autopsy on an accident case on Christmas Eve and this was followed by severe local infection, which it was hoped for several weeks would not become generalised. Her death occurred on Jan. 21st.

Iris Fox was the youngest daughter of Dr. R. Fortescue Fox and was born at Strathpeffer Spa, of the sixth medical generation in direct line of the Fox family. She was educated at Queen's College, Harley-street, and the Mount School, York, and then studied for two years at the Slade School of Art before entering the London School of Medicine for Women with a scholarship. After qualifying in 1915 she held a series of resident appointments at the Royal Northern Hospital, the South-Western Fever Hospital, and the South London Hospital for Women. Towards the end of the war she spent some months at Samoëns, in French Savoy, in charge of women and children *sinistrées*, sent there by the Friends' War Victims' Committee. In 1918 she became medical registrar at the Royal Free Hospital before definitely taking up the pathological work which was to become her chief interest in medicine. After 18 months as second assistant pathologist at St. Mary's Hospital and a further year as assistant pathologist at the Swansea General Hospital, Dr. Iris Fox was appointed senior assistant pathologist at the Royal Free Hospital, which carried with it the assistant directorship of pathological studies in the London School of Medicine for Women. Just before doing so she took the M.D. Lond. with pathology as the special subject, and worked for some months on endocrine glands in relation to mental disorder, at the Maudsley Hospital, under the guidance of Sir Frederick Mott. Her time at the Royal Free Hospital was largely spent in organising an efficient bacteriological department, what remained being devoted to a study of the streptococci, especially in relation to infective arthritis,

which she was about to collate and prepare for publication at the time of her death. "The fact that so little of her work has seen the light was due," writes one of her colleagues, "to a confirmed habit of careful preparation and a certain diffidence of mind. The years spent in clinical work before her specialising in pathology had given her experience and a sense of proportion, and she was laying the foundations for really useful bacteriological investigation. In the earlier years of her work pathology had to compete for the mastery of her mind with books, people, and the countryside. Her friends never felt it necessary to remember her scientific attainments, for she was essentially an artist, and though a feeling that she lacked technical ability led her to abandon painting as a profession she had the best of taste in literature and art."

We hope that it may prove possible still to publish the work on the streptococci, to the study of which Dr. Iris Fox had devoted the best years of her life and to which by a melancholy coincidence her early death was due.

JOHN ASTLEY BLOXAM, F.R.C.S. ENG.

Mr. J. A. Bloxam, who died on Jan. 12th at the age of 82, was a surgeon of the old school, who gained a considerable reputation in plastic surgery. As a student at St. Bartholomew's Hospital he was a pupil of Sir James Paget, and after qualification as M.R.C.S. Eng. in 1864, was so fortunate as to be appointed house surgeon—and later private assistant—to that great man. Becoming F.R.C.S. in 1871, he acted for a time as assistant surgeon to the Royal Horse Guards (Blue), and when he left the Service, which gave him hardly enough scope for his talents as an operator, was appointed surgical registrar at St. Bartholomew's. In 1873 he became assistant surgeon to Charing Cross Hospital, and for more than 30 years gave devoted service to this institution and its medical school.

Mr. Bloxam's remarkable dexterity and neatness made him an excellent plastic surgeon. His methods, so far as antiseptic or aseptic technique were concerned, might be conservative, but his results were remarkably good, and it has been regretted that a man with such gifts for general surgery should have early specialised in venereal disease. The repair of tertiary syphilitic destruction, however, gave him many opportunities for exercising his ingenuity. The transplantation of part of a finger to form the basis of a new nose was one of his successes, and created a sensation at a time when plastic surgery was hardly even in its infancy. In course of time Mr. Bloxam became senior surgeon to Charing Cross Hospital and was also senior surgeon to the London Lock Hospital. Although he regarded himself as a disciplinarian he had the kindest of hearts and made very many friends. On his retirement to Bourne End, Buckinghamshire, where he inherited a small estate, he took a prominent part in the public life of the district, and was a justice of the peace and chairman of the Little Marlow Parish Council. For recreation he took delight in fishing and shooting.

Mr. Bloxam was a Knight of Grace of the Order of St. John of Jerusalem. He is survived by his wife, a son, and two daughters.

THE EDUCATIONAL HEALTH AND FOOD CAMPAIGN.—This campaign was inaugurated in 1907 and has since been carried on with the help of numerous medical, philanthropic and other bodies. The intention of the organisers has been to spread information on how to keep healthy and on the choice and preparation of food. No special system of diet has been advocated, but attention has been directed to those foods which nourish best at least cost; the value of finely-ground wholemeal bread has been emphasised. At the request of the Bread and Food Reform League the campaign is now being continued by the People's League of Health. Funds are urgently needed to fight the widespread ignorance of the public. Local health authorities are being urged to arrange meetings and to publish and distribute educational pamphlets. The signatories of the appeal, issued from 12, Stratford-place, London, W. 1, include many distinguished medical men. Subscriptions may be sent to the hon. organiser.

Medical News.

UNIVERSITY OF OXFORD.—The Rolleston Memorial Prize, which is now worth about £100, will be awarded in the Trinity term for a memoir of original research in animal or vegetable morphology, physiology, pathology, or anthropology. The prize is open to Bachelors in Arts or Medicine at Oxford and Cambridge within six years of graduation and ten years of matriculation, and also to certain others who have been candidates for such graduation or for the B.Sc. at Oxford. Work already published is admitted to the competition, and candidates must forward their memoirs to the Registrar of the University of Oxford before March 31st next.

UNIVERSITY OF LONDON.—A course of six lectures on the Physiology of Muscle will be given by Prof. A. V. Hill at University College, Gower-street, W.C., at 5 P.M., on Monday, Feb. 1st, and on the following Mondays. Admission will be free without ticket.

University College Hospital.—A series of four lectures on the History of Medicine, illustrated by lantern slides, will be delivered at University College Hospital Medical School by Dr. Charles Singer, on Thursday, Feb. 4th, and the three following Thursdays, at 4.15 P.M. The subjects of the lectures will be the History of Malaria, of Gout and Diabetes, of Rickets, and of Small-pox; they will be open to medical students.

TERRITORIAL ARMY MEDICAL OFFICERS' ASSOCIATION.—Medical officers, both active and retired, are reminded that the first annual dinner will be held on Friday, Feb. 12th, at 8 P.M. in the Café Royal, 68, Regent-street, W. Many distinguished guests are expected. Tickets may be obtained from Colonel M. B. Ray, D.S.O., M.D., at 37, Russell-square, London, W.C. 1.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—Dr. J. W. McNee will lecture for the Fellowship, on the Treatment of Renal Disease, on Feb. 4th, at 5 P.M., in the lecture hall of the Medical Society, 11, Chandos-street, London, W. A comprehensive course in Venereal Diseases begins at the London Lock Hospital on Feb. 1st and will continue throughout the month. From Feb. 8th to 27th a combined course in Diseases of Children will be given by the Paddington Green Hospital, Victoria Hospital, and the Children's Clinic. There will be morning and afternoon sessions in all departments of the hospitals. For the convenience of the general practitioner, the London Temperance Hospital has arranged to hold an evening course from Feb. 8th to 19th. A general intensive course in medicine, surgery, and the specialties will take place at the Queen Mary's Hospital, Stratford, from Feb. 15th to 27th. Daily sessions will be given at 10.30 A.M. to 5 P.M., including demonstrations of clinical methods and groups of illustrative cases. The following courses will be held in March: Medicine, Surgery, and the Specialties at the Hampstead Hospital (for the general practitioner); Bacteriology, Westminster Hospital; Diseases of the Chest, Brompton; Gynæcology, Chelsea Hospital for Women; Ophthalmology, Royal Eye Hospital; and Tropical Medicine at the London School of Tropical Medicine. All the syllabuses and the General Course programme, which also appear in the *Post-Graduate Medical Journal*, may be had on application to the Secretary of the Fellowship, at 1, Wimpole-street, London, W. 1.

JAMES MACKENZIE INSTITUTE FOR CLINICAL RESEARCH, ST. ANDREWS.—On Jan. 19th Prof. David Waterston resumed his consideration of Mackenzie's position in regard to general medicine. In his earlier works a provisional classification of symptoms into structural, functional, and reflex was adopted, the term reflex being limited to such manifestations as the viscero-motor and viscero-sensory reflexes. But in his later work he pointed out that the functional activity of each organ is regulated and controlled so that it is adapted to the needs of the whole body from moment to moment, and that this regulation is effected by reflex activity. He therefore included functional symptoms in the class reflex. The view put forward that the majority of symptoms, other than structural, are due to the disturbance of normal reflexes is of the greatest value to clinical medicine. It draws attention to the fact that symptoms are end-results, and that for their proper investigation it is essential that the intermediate processes concerned in their production be detected. A particular symptom such as breathlessness may occur as a normal event, as a result of experiment, as the result of administration of a drug, or in disease. The process concerned is, however, the same in each case. The basis of medicine must therefore be a knowledge of the processes by which organs are regulated.

ROENTGEN SOCIETY.—A meeting will be held on Tuesday, Feb. 2nd, at 32, Welbeck-street, London, W., at 8.15 P.M., when R. J. McCallum Tozer will read a paper on a Gas Tube with Variable Penetrating Power, and M. A. Codd will describe a New Regulator for a Gas Tube.

ROYAL MEDICAL BENEVOLENT FUND GUILD.—A concert will be given by the Stock Exchange Male Voice Choir at the Wigmore Hall on Feb. 23rd, at 8.15 P.M., in aid of the Guild. The Choir will be assisted by Miss Dorothy Silk, Miss Margaret Fairless, Miss Kathleen Markwell, and Mr. Norman Stone, and a very attractive programme has been arranged. Tickets, from 10*s.* 6*d.* to 2*s.* 6*d.*, may be obtained from the secretary of the Choir, Stock Exchange, E.C. 2, or at the Wigmore Hall.

PRESENTATION TO PROF. RUTHERFORD MORISON.—On Jan. 21st a portrait of Prof. Morison was presented to him at Newcastle in recognition of his great services to British surgery. We are asked to state that any subscribers wishing to have a photogravure should apply immediately to Mr. R. J. Willan, 6, Kensington-terrace, Newcastle-on-Tyne, as copies will shortly be unobtainable. On page 265 is described a Russian modification of the bipp method of treating infected wounds which Prof. Morison introduced in 1916.

THE CHILD OF SCHOOL AGE.—A series of lectures on the Health of the Child of School Age is to be delivered under the auspices of the Institute of Hygiene at 28, Portland-place, London, W., on Wednesdays from Feb. 10th to April 21st, at 3.30 P.M. The first three lectures will be on the Dental Problem in Relation to School Children, by Sir Harry Baldwin, on Feb. 10th; on the Prevention of Nervous Affections in the Young, by Dr. Risien Russell, on Feb. 17th; and on Diet in Schools, by Dr. L. R. Lempriere, on Feb. 24th. A number of seats will be kept for Fellows, Members, and Associates of the Institute, but there will be ample accommodation for others interested in health problems, and seats will be reserved for the whole course on application to the secretary.

WELSH HOSPITALS REUNION DINNER.—The first reunion dinner was held at Cardiff on Jan. 16th. Colonel A. W. Sheen, who commanded the Netley and Overseas Hospitals, presided, and was supported by Lieut.-Colonel H. G. Cook, who succeeded Colonel Sheen in the command of the Netley Hospital; by Sir W. J. Thomas, the greatest benefactor of the hospital; by Alderman J. Robinson, who as Lord Mayor of Cardiff supported the hospitals throughout, and by a representative company of over 100 of all ranks. Colonel Sheen said that the Welsh Hospital was the first voluntary hospital in the war, its inception dating from August 8th, 1914. After a reference to those who lost their lives on service, he spoke in detail of the work of the Overseas Hospital in India with its 3000 beds. It was felt that a dinner which had produced so many interesting meetings should be repeated.

BUREAU OF HYGIENE AND TROPICAL DISEASES.—By decision of the hon. managing committee of the Tropical Diseases Bureau, and with the approval of the Secretary of State for the Colonies, the Bureau's name has been changed to "Bureau of Hygiene and Tropical Diseases." The Bureau traces its history back to 1908, when, as a result of the International Sleeping Sickness Conference of 1907, the Colonial Office founded the Sleeping Sickness Bureau which, for four years, carried on its work of preparing and publishing the *Sleeping Sickness Bulletins* in a room put at its disposal by the Royal Society. Towards the end of this period it brought out also the *Kala-Azar Bulletin*, and in 1912 it outgrew its accommodation and moved to the Imperial Institute. Here its scope was widely increased and it became the Tropical Diseases Bureau, publishing in place of the journals named the *Tropical Diseases Bulletin*, now in its twenty-third volume, and the *Tropical Veterinary Bulletin*, of which 13 volumes have appeared. In 1920 it again outgrew its quarters and removed to what was then the new building of the Seamen's Hospital Society at 23, Endsleigh-gardens, where it occupies rooms put at its disposal by the new School of Hygiene and Tropical Medicine. Last year the managing committee, recognising the advances made in the practice of preventive medicine and the increasing need of the tropical and other Colonies for recent information on all branches of hygiene, decided to replace the Sanitation Supplements of the *Tropical Diseases Bulletin* by a monthly *Bulletin of Hygiene*, planned to meet the needs of the Dominions as well as the Colonies. The new journal will make its appearance this week. Dr. J. F. C. Haslam, recently Government medical officer of health of British Guiana, has replaced Colonel A. Alcock as assistant director and is in editorial charge of the new bulletin. The Bureau's name is now co-extensive with its activities.

THE LATE DR. THOMAS BERRY.—Whilst attending a dance arranged by the Woolwich Tuberculosis Care Committee on Jan. 22nd, Dr. Thomas Berry, who was a well-known practitioner in the Woolwich district, collapsed and died within a few minutes. Dr. Berry was a graduate of Glasgow University and was about 60 years of age.

MIDDLESEX HOSPITAL ON THE FILM.—A Pathé film of scenes in Middlesex Hospital has been prepared in support of the appeal for the rebuilding fund. The film shows the museum, work proceeding in the laboratories, the wards strutted to prevent collapse, the preparations for an operation, and so forth. Twelve minutes are required for its exhibition.

POOR-LAW HOSPITAL AT ROMFORD.—Last week Mr. Charles Rhys, M.P., opened two additional hospital blocks and a new nurses' home which the Romford Guardians have erected at a cost of nearly £100,000. There are 112 beds in each of the new blocks and accommodation has been provided for 100 nurses. The extension is necessitated by the development of the Becontree estate and other large adjacent areas.

"GOUT" AND ORTHOPÆDICS.—The Flintshire County Council is establishing a clinic for the treatment of orthopædic cases, the staff of which will be provided by Miss Hunt, the founder of the Shropshire Orthopædic Hospital. At a meeting explanatory of the scheme, Miss Hunt said that girls frequently complained to her of gout in the feet, whereas they were suffering from shoes with pointed toes and high heels.

LAW OF INQUESTS: CORONER URGES REFORM.—At an inquest on Jan. 21st, Mr. C. W. Surridge, the Manchester city coroner, drew attention to the unfortunate fact that inquests have to be held at the place where the body lies. In an accident case, such as the one he was dealing with, the proper place to hold the inquiry was the place where the accident occurred—where the coroner and jury were familiar with the locality. What prevented this common-sense procedure was the law enforcing the viewing of the body by the coroner. "I deeply regret," said Mr. Surridge, "that the draft of the new Coroners' Bill perpetuates this useless anachronism."

THE LATE DR. ROBERT BELL.—Dr. Bell, who died at his home in Kensington, on Jan. 20th, in his eighty-second year, had been physician to the Glasgow Hospital for Women for a period of 21 years, when, in 1896, he turned his attention to the problems of cancer. The direction which that attention took is well known. He came to London in 1904, became physician at the Battersea or Antivivisection Hospital, and published his view that cancer was a preventable disease due to contravention of the laws of nature, and that the disease was only made worse by operative interference. He wrote a book in which he submitted that complete disappearance of the disease occurred in the majority of cases of those who submitted themselves sufficiently early to his method of treatment, and he seems to have honestly believed that the rest of the medical profession would have adopted his views had they not been prevented by the loss of pecuniary returns.

MILK INEFFICIENTLY PASTEURISED.—A summons, stated to be the first of its kind in the country, was dismissed at the Wigan police court on Jan. 11th, for the alleged selling of pasteurised milk which had not undergone efficient pasteurisation. Evidence was given that a consignment of milk was received from the defendants at Wigan by a local retail firm, and that samples taken at the station had been submitted to Mr. Ernest Melling, analytical chemist to the corporation, who stated that although they were of very good quality the samples had not responded to the special colouration test to which he had submitted them, as efficiently pasteurised milk should have done. The milk had not been retained at a temperature of 150° F. for half an hour to complete pasteurisation which purchasers might expect. The manager of the Dalbeattie and District Farmers' Association, which supplied the milk to the defendants, admitted that since Nov. 2nd, at the request of customers, they had heated the milk to 150° F., but had not retained it at that heat for the usual half hour. It was not sold as pasteurised milk. Mr. Gilbert Hicks, Barnard Castle, who appeared for the defence, said that the case was extremely interesting and was novel for a police court. It was submitted that if there had been an offence—which was not admitted—the proceedings had been taken under the wrong Act—viz., the Food and Drugs Act instead of the Milk and Dairies Act of 1922. The magistrates after consultation dismissed the case.

GLASGOW ROYAL MATERNITY HOSPITAL.—Lady Blythswood last week opened new laboratories and administrative offices. The laboratories will provide facilities for research as well as for the ordinary work of the hospital.

HOSPITAL, HEALTH, AND NURSING EXHIBITION.—The sixteenth annual exhibition is to be held in the Central Hall, Westminster, from April 12th to 16th, and will contain a hospital section organised by the Hospital Officers, Association. Applications for space should be made immediately to the Secretary, 12B, Belsize Park-gardens, London, N.W. 3.

DONATIONS AND BEQUESTS.—Mr. Williamson Lamplough, underwriter, Blackheath and Bishopsgate, E.C., besides many other bequests, gave £1000 to the new medical fund of the Wesleyan Missionary Society.—Miss Agnes Marie Jacobina Zimmermann, of Devonshire-street, W., composer and musician, besides other bequests, left to the Hospital of St. John and St. Elizabeth, Grove-road, N.W., £1500 for an Agnes Zimmermann bed; £1200 to the New Hospital for Women, Euston-road, N.W., for an Agnes Zimmermann bed; £100 each to the Middlesex Hospital; the Royal Hospital for Incurables, Putney; the Metropolitan Convalescent Institution, the St. Marylebone Dispensary, the Seamen's Hospital, Greenwich; and £50 each to the Dental Hospital, Leicester-square; the Royal Hospital for Diseases of the Chest, City-road; and the Florence Nightingale Hospital.—Mr. George Frederick Spittle, Solihull, Birmingham, who left estate of the value of £52,333, after certain bequests, left his property to his wife, and on her death he made further bequests, and gave two beds in the Birmingham General Hospital to be endowed at the cost of his residuary estate, and to be named after his wife and himself; also £2000 to the Birmingham Blue-coat School, £1000 each to the Birmingham and Midland Eye Hospital and the Birmingham and Midland Hospital for Women; £500 each to the Birmingham and Midland Ear and Throat Hospital, the Royal Orthopædic and Spinal Hospital, Birmingham; the Royal Institution for the Blind, Birmingham; the Birmingham Children's Hospital; the Queen's Hospital, Birmingham; the Jaffray Branch Hospital, Birmingham, and the Birmingham Medical Mission, and the ultimate residue of his property for charitable purposes as his wife may appoint.—Miss Mary Elizabeth Norman, Rugby, left £1000 to the Hospital of St. Cross, Rugby, for the endowment of a bed.—Mr. Alfred Davies, Handsworth, Birmingham, left £500 each to the Birmingham and District Cripples Union and the Birmingham Royal Institution for the Blind.—Mr. William Heming Way, of Leeds, brewer, left £2000 to the Leeds General Infirmary, £1000 to the Leeds Public Dispensary, and £500 each to the Hospital for Women and Children, Leeds; the Leeds Maternity Hospital, and the Leeds Workpeople's Hospital Fund for the convalescent homes.—Mr. Henry Griffith Thomas, mining engineer, of Swansea, besides bequests to other institutions, left £1000 each to St. Dunstan's Hostel for Blinded Sailors and Soldiers and the Swansea General and Eye Hospital.—The Government of British Guiana has sent a second donation of £100 to the Ross Institute Hospital for Tropical Diseases, Putney Heath.—The late Sir Charles Brown by will left £80,716. The proceeds of his residence and effects will go to the Harris Orphanage. Preston Royal Infirmary's convalescent home, Lostock Hall, is to get two-thirds of the residue of his estate, about £30,000 or perhaps more, and Preston Borough Police Poor Children's Convalescent Home at Lytham, the income from the investment of the other third on the death of his sister. This will be about £15,000. He left £1000 to Cambridge University Research Hospital.—Mrs. Sarah Martha Grove-Grady left, among other large bequests, £4000 to the British Home and Hospital for Incurables, Crown-lane, Streatham, S.W.; £4000 to the Royal Blind Pension Society of the United Kingdom, of Southwark Bridge-road, S.E., for the benefit of female pensioners only; and £1000 to the Royal Society for the Indigent Blind, Leatherhead.—Mrs. Mary Margaret Fair Memes or Maxwell, of Bangholm Bower, Trinity-road, Goldenacre, Edinburgh, left £1000 to the Edinburgh Cripple and Invalid Children's Aid Society and £500 to the Edinburgh District Branch of the Scottish National Society for the Prevention of Cruelty to Children, among other bequests.—Miss Elizabeth Nicholson, of Leonard-street, Keswick, Cumberland, left £2100 to the Westmorland County Hospital for three cots.—Colonel Gilbert Omerod Spence, Kirklevington, Yarm-upon-Tees, Yorks, besides other bequests, left £1000 each to the Stockton and Thornaby Hospital and the District Nursing Association.—The Royal Manchester Children's Hospital has received £1000 from the executors of Mr. John Chadwick Barlow to endow a bed.—A private donor has offered to give £5000 if the remaining £15,000 of the bank overdraft of the West London Hospital can be quickly subscribed.

RETIREMENT OF DR. G. S. MIDDLETON.—On Jan. 14th, to mark his retirement from active consultant practice, some 120 medical men from different parts of the British Isles entertained Dr. G. S. Middleton to dinner at the Central Station, Glasgow. Dr. William Sewell presided; Dr. William G. Dunn, Dr. J. B. Mackenzie Anderson, and Dr. George MacFeat acted as croupiers, and Dr. John Fergus as secretary. Dr. Sewell, who proposed the health of Dr. Middleton in a speech reminiscent of old college and hospital days, referred to the personal qualities of Dr. Middleton, to his loyalty of heart, his integrity of purpose, his fine judgment and ripe experience, and his unswerving devotion to the highest traditions of his profession. He had been a valuable assistant to the late Sir William Gairdner, and his connexion with the Royal Infirmary and the Royal Hospital for Sick Children, to which institutions he was now consulting physician, and with the Western Infirmary, had made for him many friends, several of whom were present that evening. At the end of his speech Dr. Sewell presented Dr. Middleton with a handsome solid silver salver and coffee service. Sir Hector Cameron supported the toast, to which Dr. Middleton replied. The toast of the Glasgow Medical School was proposed by Dr. C. O. Hawthorne and replied to by Dr. W. R. Jack.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
MONDAY, Feb. 1st.—8.30 P.M., Social Evening. 9.30 P.M., Dr. F. J. Poynton: The Part Taken by Doctors in the Early Days of Aeronautics.
TUESDAY.—5.30 P.M., ORTHOPÆDICS. (Cases at 5 P.M. by Mr. W. Rowley Bristow, Mr. P. Bernard Roth, Mr. Rocyn Jones, and others. 8.30 P.M., PATHOLOGY. Laboratory Meeting at University College Hospital, W.C.
WEDNESDAY.—4 P.M., SURGERY. Clinical Meeting at St. Bartholomew's Hospital, E.C. Operations at 4.15 P.M., and demonstrations in other departments.
THURSDAY.—8 P.M., OBSTETRICS AND GYNÆCOLOGY. Specimens by Dr. McCullagh and Dr. Everard Williams. Short communications by Dr. Abercrombie and Mr. Herbert Paterson. Demonstration by Dr. Barnard. Prof. Louise McIlroy: Pulmonary Tuberculosis Complicated by Pregnancy
FRIDAY.—5 P.M., LARYNGOLOGY. Cases and specimens will be shown at 4 P.M. 8.30 P.M., ANÆSTHETICS. Dr. C. F. Hadfield: Nitrous Oxide: Its Impurities, and the Establishment of Tests Suitable for Official Adoption.
SATURDAY.—10.30 A.M., OTOLOGY. Cases by Dr. Dan McKenzie, Mr. F. W. Watkyn-Thomas, Mr. Archer Ryland, and others at 9.45 A.M.

ROYAL INSTITUTION, 21, Albemarle-street, London, W.
TUESDAY, Feb. 2nd.—5.15 P.M., Mr. Eric Rideal, D.Sc.: Surface Action.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.
MONDAY, Feb. 1st.—5 P.M., Prof. Arthur Edmunds: Pseudo-Hermaphroditism and Hypospadias and their Surgica Treatment.
WEDNESDAY.—5 P.M., Prof. J. E. Adams: The Surgery of the Jejunum.
FRIDAY.—5 P.M., Prof. Musgrave Woodman: Malignant Disease of the Œsophagus.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.
MONDAY, Feb. 1st, to SATURDAY, Feb. 6th.—Fellowship of Medicine lecture, Medical Society, 11, Chandos-street. Thurs., 5 P.M., Dr. McNee: The Treatment of Renal Disease (free to members of the medical profession).—HOSPITAL FOR DISEASES OF THE SKIN, Blackfriars-road, S.E. Instruction in the O.P. Department from 2.30 P.M. Tues. and Fri., 5.30 P.M., Venereal Clinic.—LONDON LOCK HOSPITAL, Dean-street, W. Comprehensive course. Instruction in the O.P. Department daily and lectures dealing with the various aspects of V.D.—LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W. Thurs., 2 P.M., Mr. H. J. Paterson: Special clinical demonstration for members of the Fellowship of Medicine. Further information from the Secretary of the Fellowship of Medicine.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, Feb. 5th.—3 P.M., Mr. Watkyn-Thomas: Swellings of the Upper Jaw.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.
WEDNESDAY, Feb. 3rd.—Dr. Harrison: Blood-Sugar Curves and their Interpretation.
THURSDAY.—4 P.M., Mr. Doyne: Ocular Torticollis.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C. 1.

POST-GRADUATE COURSE will be held from FEBRUARY-MARCH, 1926.

CLINICAL LECTURES AND DEMONSTRATIONS.

MONDAY, Feb. 1st.—12 noon, Pathology of the Nerve Cell: Dr. Greenfield. 2 P.M., Out-patient Clinic: Dr. Hinds Howell. 3.30 P.M., Hemiplegia: Dr. Risien Russell.

TUESDAY, Feb. 2nd.—2 P.M., Out-patient Clinic: Dr. Walshe. 3.30 P.M., Disseminated Sclerosis: Dr. Grainger Stewart.

WEDNESDAY, Feb. 3rd.—2 P.M., Clinical Demonstration: Dr. Gordon Holmes.

THURSDAY, Feb. 4th.—12 noon, Anatomy and Physiology of the Nervous System: Dr. Walshe. 2 P.M., Out-patient Clinic: Dr. Kinnier Wilson. 3.30 P.M., The Paralysed Bladder: Dr. Gordon Holmes.

FRIDAY, Feb. 5th.—2 P.M., Out-patient Clinic: Dr. Adie. 3.30 P.M., Demonstration of Re-educative Exercises: Mr. Elmquist.

Additional particulars will be given in further announcements.

J. G. GREENFIELD, Dean of Medical School.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Feb. 1st.—10 A.M., Surgical Out-patients: Mr. W. E. Tanner. 10.30 A.M., Gynæcological Operations: Mr. A. E. Giles; Throat, Nose and Ear Operations: Mr. W. Ibbotson. 2 P.M., Medical, Surgical, and Gynæcological Clinics, Operations. 6.30 P.M., Venereal Department.

TUESDAY.—2 P.M., Medical, Surgical, Throat, Nose and Ear Clinics, Operations. 4.30 P.M., Mr. T. H. C. Benians: Specimens illustrating Diseases of the Breast.

WEDNESDAY.—10.30 A.M., Surgical Operations: Mr. E. Gillespie. 2 P.M., Medical, Eye, and Skin Clinics, Operations. 5.30 P.M., Venereal Department.

THURSDAY.—10.30 A.M., Dental Out-patients: Mr. E. S. Pierrepont. 2 P.M., Medical, Surgical, and Throat, Nose and Ear Clinics, Operations. 5 P.M., Operations.

FRIDAY.—10.30 A.M., Eye Operations: Mr. N. Fleming. 2 P.M., Surgical, Medical, and Children Clinics, Operations. 3 P.M., Gynæcological Clinic. 6.30 P.M., Venereal Department.

QUEEN CHARLOTTE'S MATERNITY HOSPITAL, Marylebone-road, N.W.

THURSDAY, Feb. 4th.—5 P.M., Mr. L. C. Rivett: Infant Feeding.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.

THURSDAY, Feb. 4th.—4.15 P.M., Dr. Charles Singer: The History of Malaria (first of four lantern lectures, open to medical students of the University of London).

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, Leicester-square, W.C.

TUESDAY, Feb. 2nd.—5 P.M., Dr. H. MacCormac: Lupus Erythematosus.

THURSDAY.—5 P.M., Dr. A. M. H. Gray: Xanthoma. Herpes.

ROYAL DENTAL HOSPITAL OF LONDON SCHOOL OF DENTAL SURGERY.

WEDNESDAY, Feb. 3rd.—5.30 P.M., Mr. F. Coleman: The Value of "Set" Operations on the Jaws and Teeth.

ROYAL SANITARY INSTITUTE.

FRIDAY, Feb. 5th in the Town Hall, Bradford).—3 P.M., Discussion on Child Welfare Centres and their Adjuncts. 5 P.M., Discussion on Town Planning and Improvement Areas.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINIC.

FRIDAY, Feb. 5th.—3.30 P.M. (at the Royal Hospital). Mr. F. Wilson: Demonstration of Surgical Cases.

ST. MARY'S HOSPITALS, MANCHESTER, POST-GRADUATE LECTURE.

FRIDAY, Feb. 5th.—4.30 P.M. (at Whitworth-street West Branch), Dr. F. H. Lacey: Common Ailments of Pregnancy.

Appointments.

WHITMAN, H. D. E., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer for the Roath medical district and the Roath and Cathays Children's Homes, S. Wales.

Vacancies.

For further information refer to the advertisement columns.

All Saints' Hospital, 49/57, Vauxhall Bridge-road, S.W.—Non-Res. Jun. H.S. £100.

Barnsley County Borough.—Asst. M.O.H., &c. £600.

Barrow-in-Furness, North Lonsdale Hospital.—H.S. £175.

Bolingbroke Hospital, Wandsworth Common, S.W.—Res. M.O. £200. Also H.S. At rate of £120.

Bootle Borough Hospital.—Jun. H.S. £125.

Bristol Eye Hospital.—H.S. £150.

Dorset Mental Hospital, Herrison, near Dorchester.—Deputy Med. Supt. and Pathologist. £575.

East London Hospital for Children and Disp. for Women, Shadwell, E.—S. for Nose, Throat, and Ear.

Exeter, Royal Devon and Exeter Hospital.—Sen. H.S. £200.

Hertford County Hospital.—H.S. At rate of £150.

Hospital for Sick Children, Great Ormond-street, W.C.—Res. Med. Supt. £300.

Isle of Wight County Council.—Two Asst. County M.O.'s. £730 and £750 respectively.

Leeds City.—Chief Clin. Tuberculosis O. £1000.

Leeds Public Dispensary.—Sen. Res. M.O. £200.

Liverpool Children's Hospital, Heswall Branch.—Res. M.O. At rate of £150.

Liverpool Children's Hospital, Myrtle-street.—Two Res. H.P.'s and Two Res. H.S.'s. All at rate of £60.

Liverpool Open-Air Hospital for Children, Leasowe, Cheshire.—Res. Jun. M.O. £200.

Liverpool Royal Infirmary.—Hon. S. to Lock Dept.

London Lock Hospital, 91, Dean-street, W.—Surg. Reg. £100.

Manchester, Ancoats Hospital.—H.S. At rate of £100.

Manchester Ear Hospital.—Hon. Radiologist.

Manchester, Ministry of Pensions Hospital, Grangethorpe.—Jun. M.O. £350.

Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Hon. Emergency S.

Northampton County Mental Hospital, Berry Wood.—Sen. Asst. M.O. £500.

Northampton General Hospital.—Third H.S. At rate of £150.

Northamptonshire County Council.—Tuberculosis Officer. £750.

Northern Hospital, Winchmore Hill, N.—Asst. M.O. for Encephalitis Lethargica Unit. £550.

Nottingham General Dispensary, Broad-street.—Res. Surg. £250.

Nottingham General Hospital.—H.S. for Ear, Nose and Throat Dept. At rate of £150.

Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—Cas. O. At rate of £100.

Royal Northern Hospital, Holloway, N.—Cas. O. At rate of £90. Also Asst. Surg. O. £75.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Part-time Pathologist. £200.

St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—H.S. At rate of £75.

Salford Union Infirmary, Hope, Pendleton, near Manchester.—Two Asst. Res. M.O.'s. £300 and £275 respectively.

Sheffield City.—Jun. Asst. Tub. O. £350.

Sheffield Royal Hospital.—Ophth. H.S. £80.

Southampton, County Borough Isolation Hospital.—Res. M.O. £360.

Swindon Borough.—Asst. to M.O.H. £600.

Warrington, Lancashire County Mental Hospital, Winwick.—Deputy Med. Supt.

West Bromwich and District Hospital.—Res. H.S. £220.

West London Hospital, Hammersmith, W.—Asst. Path. £250.

Wilts County Council, Venereal Diseases Clinic, Swindon.—Part-time M.O.'s. £1 11s. 6d. per session.

THE Chief Inspector of Factories, Home Office, London, S.W., announces vacant appointments for Certifying Factory Surgeons at St. David's, Pembrokeshire; and at Plymouth, West, Devonshire.

Births, Marriages, and Deaths.

BIRTHS.

GIBB.—On Jan. 19th, in London, the wife of James Gibb, M.A., M.B., Ch.B., Downham Market, Norfolk, of a daughter.

HINE.—On Jan. 18th, at The Ivies, Carter Gate, Newark-on-Trent, the wife of Dr. Hine, of a son.

PEGGE.—On Jan. 18th, at Elmfield-avenue, Leicester, the wife of Dr. A. Vernon Pegge, of a son.

SHIRES.—On Jan. 25th, at Welbeck-street, W., the wife of Dr. Bertram Shires, of a son.

MARRIAGES.

GREEN—ROBERTSON.—On Jan. 22nd, at All Saints' Church, Willian, Dr. Frederick Norman Green, to Margaret Campbell, third daughter of Mr. and Mrs. J. Campbell Robertson, of Nutleigh Grove, Hitchin, Herts.

DEATHS.

BELL.—On Jan. 20th, at Thorney Court, Hyde Park-gate, Dr. Robert Bell, aged 81.

DURDIN.—On Jan. 16th, at King's Lynn, Robert Charles Garde Durdin, M.D., L.R.C.P.I., L.R.C.S.I.

FOX.—On Jan. 21st, at the Royal Free Hospital, of septicæmia, Iris Fox, M.D. Lond.

MAWHOOD.—On Jan. 20th, at Green Meadows, Ascot, Reginald Hawksworth Mawhood, M.B., B.C. Cantab., F.R.C.S. Eng., aged 41 years.

PANTIN.—On Jan. 21st, at a nursing home, Boscombe, Dr. Mabel Pantin.

ROBINSON.—On Jan. 16th, at Harpur-street, Bedford, George Robinson, M.R.C.S., L.M., J.P., aged 87 years.

SCORESBY-JACKSON.—On the 20th Jan., at a nursing home in London, Arabella Mary, younger daughter of the late Robert Edmund Scoresby-Jackson, M.D., F.R.S.E., &c., and sister of Dr. Margaret Scoresby-Jackson, 28, Weymouth-street, W.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE TREATMENT OF CONTAMINATED WOUNDS WITH BIPP AND A MODIFICATION.

BY ELIZABETH L. THAL, M.D.,

ASSISTANT AT THE HOSPITAL SURGICAL CLINIC OF THE SECOND MOSCOW STATE UNIVERSITY. (DIRECTOR: PROF. P. D. SOLOVOFF.)

IN 1916 Prof. Rutherford Morison suggested the treatment of contaminated wounds with a paste made up of bismuth, iodoform, and paraffin, and called bipp. He proposed that septic wound cavities should be bathed with methylated spirit and plugged with bipp, and closed by primary suture. Subsequently Morison himself only plugged small cavities and in larger ones spread the paste along the walls, whilst various modifications are in use by other surgeons, many of whom ignore the fundamental idea of the treatment—namely, cleansing and direct suture. In Germany and America the method is not much in use, and in Russia it has not been tried until recently.

A Modified Method.

In the surgical clinic of the Second Moscow State University we applied Morison's method for about a year, at first carrying out the instructions exactly and later modifying and simplifying its details. We now use the following technique, which is simple to carry out and permits the sewing up of almost any contaminated wound:

1. The operative field is prepared by coating it with tincture of iodine.

2. The cavity is opened wide and pus and sequestra are removed. There is no necessity, however, for any deep or rough excision of the walls or the removal of the pyogenic membrane.

3. After careful examination of the cavity it is cleansed with pure alcohol. Excess of alcohol is removed and bleeding vessels are ligatured.

4. The walls of the cavity are mopped with a liquid of the following composition: 8 parts of iodoform dissolved in 25 parts of ether and 75 parts of alcohol. The ether instantaneously evaporates, the alcohol passes off, and the cavity is left uniformly coated with a thin covering of exceedingly minute crystals of iodoform which have been just precipitated. We do not traumatise the cavity of the abscess by rubbing in the paste, and the tissues are not eroded by a more or less massive layer of foreign substance. Such a mass has either to be dissolved and absorbed, or—which is more unpleasant—must fall out piecemeal, and it can only gradually be replaced by cicatricial tissue; the cicatrix under these circumstances is, of course, massive and indurated. When only solutions are used the tissues may be brought into contact by means of a sunk suture or, if preferred, by the aid of a properly applied compressing bandage or a plaster dressing.

5. The final act is complete suture of the skin. For the sunk stitches we use catgut, for the skin stitches silk; both these substances are previously coated with the original Morison bipp paste of the following composition: 8 parts of subnitrate of bismuth, 16 parts of iodoform, 8 parts of liquid paraffin.

Reduction of Tension.

The whole of this process is exceedingly simple: it is reduced to the bathing of the cavity with two liquids, and occupies not more than three to five minutes. There are, however, two facts to be taken into account. First, that during the time of the operation there is a succession of a dirty and a clean moment, and it is necessary to cleanse oneself, the instruments, and the field of operation, as is done in any intestinal operation. Omission of this precaution is a cause of failure. Secondly, careful apposition of the edges of the skin wound must be effected without stretching them in any way. For this purpose slight incisions into the skin in order to relax it may be made at the sides of the operative suture. It should be made a rule that the loosening cuts into the skin are made in all those cases where the skin at the moment of operation is found to be involved in the area of infiltration, because stitches in highly infiltrated skin must, of necessity, break through quite soon after the operation, before the infiltration has had time to complete its retrogression. In addition to reducing strain in the region of the suture, parallel cuts in the skin at once remove the high tension existing in the area of the infiltrate and ward off the formation of œdema in the region of operation; so that this insignificant interference should never be omitted wherever the least indication for it exists.

Usually after the closure of a large cavity, as above described, there is at first a more or less copious sero-sanguineous secretion which oozes between the stitches but does not impair the general course of healing. It does not influence the temperature curve, and only necessitates changing the gauze which covers the line of the suture, once every three or four days. If, however, there is but little secretion or none at all, re-dressing must be done as rarely as possible.

Pharmacological Considerations.

I shall not dwell on the chemical and pharmacological properties of iodoform and alcohol and will merely point out that we were entitled to exclude bismuth not only on account of its unpleasant mechanical influence, but also because it does not produce any considerable healing effect. A detailed examination of bipp, carried out by Chambers and Goldsmith,[1] has shown that its bactericidal power by no means depends on the nitrate of bismuth contained in it. The latter, or rather the inconsiderable quantity of free nitric acid given off from it, is probably only a catalyst which accelerates the liberation of free iodine from iodoform under the influence of oxygen.

The modified method which we use does not produce iodism, nor is there any poisoning from the inconsiderable quantity of pure alcohol introduced into the body. The only question of essential importance is whether we do not create considerable local injury—whether we do not impair vital activity and hinder the progress of healing. Only if we are able to answer this question in the negative are we entitled to adopt so radical an antisepsis of the wound. Neither we nor other writers (few it is true) who have dealt with the bipp method have observed any mishap. I will quote two examples in which unhealthy tissues of low healing power were involved:—

(*a*) An ulcerating cancer of the skin on the site of previous lupus; extirpation. Extensive flap formation, the flaps being cut out of the cicatricially modified lupus skin. Careful twice-repeated "bipping" of the base and the flaps. Smooth union. A year later the patient attended again with secondary deposits of cancer, but the flaps were in an excellent condition.

(*b*) A purulent and diffuse tuberculous lympho-granuloma on the neck was opened; the cavity was treated with our modification of the bipp method and closed with sutures. It was difficult to replace in the cavity of the abscess the abundance of fungous masses which had developed. The silk stitches were passed through highly sclerosed œdematous tissue. On the ninth day they were removed and the wound had healed up by first intention. Two and a half weeks after the operation the patient attended and the sutured line was found in good condition. We do not know how the patient fared after this and what was the further course of his fundamental disease, but the direct power of healing and cicatrisation of the tissues had not suffered to any noteworthy extent.

Judging therefore by practical results, antisepsis with immediate closure of infected wounds is thoroughly justified, and we believe that theoretical considerations afford similar justification.

Inflammation in the tissues is manifested by two fundamental processes—viz., excessive osmotic pressure, and excessive hydrogen-ion concentration at the site of injury, which may be 50 times increased. By incision the pressure is relieved, and just as we do not wait to allow an abscess to rupture spontaneously, so we need not refuse to alter the chemical and physico-chemical reactions of the inflamed tissues so far as we are able. Only on the basis of some alteration of reaction can we explain the fact observed by Morison and others, that for a long time after operation cultures from the sero-sanguineous discharge from the wound which oozes out between the stitches will still produce a scanty growth of organisms, although all signs of inflammation disappeared from the first day.

Results of Trial.

Our clinic is exceedingly poor in pyogenic material, and the treatment above described was applied to only 40 cases during a year. All of them were infections by *Staphylococcus aureus*. No definite deductions, therefore, can be made, but the impression we have received is unquestionably favourable. We applied the method in abscesses of the soft tissues and in varied plastic operations on the skin, and the flaps in these cases always united well and we did not have to concern ourselves beforehand with the asepsis of the region of transfer. Our rule was to apply it in osteomyelitis and chrondritis and in suitable cases of tuberculosis of the bones and joints, complicated by mixed infection. After the operation for osteomyelitis we never observed the sequestration of the bones which was previously so frequent.

The regional lymphatic glands never gave any observable reaction in our cases, the stitches could be removed on

[1] L. G. Anderson and H. Chambers: The Treatment of Septic Wounds, with an account by H. Chambers and J. N. Goldsmith (Reports to the Medical Research Committee), THE LANCET, 1917, i., 331.

the ninth to fourteenth day. The reduced local and general reaction and the comparatively early function of the operative region make clearly evident the advantages of this method, whilst even in the case of failure all that is necessary is to loosen the stitches and the patient is in the same position as a subject treated without plugging, except that his infection is more or less reduced.

COLONIAL HEALTH REPORTS.

Gold Coast.

A REPORT by Mr. A. A. C. Finlay, acting Colonial Secretary, for the year ending March 31st, 1924, states that the population of the Gold Coast and its dependencies at the last census was 2,299,961. The number of Europeans resident in the Colony in 1924 was 3043, of whom 994 were officials, 97 missionaries, 1425 engaged in mercantile occupations, and 527 in mining. 2941 births and 117 still-births were registered during the year, and 3285 deaths, these figures including Europeans. The number of births stated is lower than it should be, as birth registration is still unpopular amongst the illiterate classes. The figure for deaths is approximately accurate, for no burial permits are granted without registration, the issuing of permits and registration of deaths being done by the same officer. The chief causes of death were pulmonary and intestinal diseases. The death-rate per 1000 among the European population was 7·88 and the invaliding rate 28·59. The ten deaths amongst European officials were due: two to yellow fever, two to blackwater fever, three to heart failure, and one each to chronic myocarditis, rupture of thoracic aneurysm, and cerebral embolism. Of the 14 deaths amongst European non-officials, eight were due to yellow fever, two to blackwater fever, and one each to alcoholism, fracture of skull, cerebral malaria, and cyanide poisoning. The average daily number of European officials on the sick list compared to the average daily number resident in the Colony was 2·42 per cent. Treatment was given in 5963 cases of malaria, 551 of dysentery, 534 of pneumonia, 411 of tuberculosis, 44 of plague, two of small-pox, and six of sleeping sickness. The sanitary condition of most of the large towns was fairly satisfactory. 490,513 houses were inspected during the year and the average larval index was 0·94 per cent. There were 3726 prosecutions under the Destruction of Mosquitoes Order. There was an outbreak of relapsing fever of a very mild type and low mortality-rate. Plague broke out in Sekondi, and up to the end of the year the case-mortality of the known and suspected cases worked out at 60 per cent. There has been no outbreak of small-pox, though nine cases were reported, eight in the Northern Territories and one in the Colony. The number of vaccinations performed was 82,425, and 36,468, or 44·24 per cent., were reported as successful. The efforts of the medical and sanitary authorities in promoting the treatment of disease and the knowledge of general hygiene continue to exercise a beneficial effect on the general health of Europeans. The climate, though hot and damp, is cooler than that of most tropical countries situated in the same latitude. It is not in itself unhealthy; but an evil reputation has been earned for it in the past by the prevalence of mosquito-borne diseases against which all possible precautions have constantly to be taken. The Gold Coast is peculiarly free from many of the discomforts associated with tropical countries; hot nights and intense heat by day are the exception rather than the rule, while insects are comparatively unobtrusive. The rainfall in 1923 varied as follows at the different stations: Accra, 21·16 inches; Aburi, 43·14; Sekondi, 39·29; Axim, 109·18; Tarkwa, 71·72; Kumasi, 55·75; Tamale, 36·03. At Accra the mean shade temperature was 81° F., at Kumasi 79·4°, and at Sekondi 79·8°. The mean daily range of temperature in Accra was 15·6°.

Gibraltar.

Mr. C. W. J. Orr, Colonial Secretary, in the annual report, states that the estimated total civil population at the close of 1924 was 17,324, of whom 16,177 were fixed residents. These figures represent the population between sunset and sunrise; to calculate the daily population it would be necessary to add some 8000 aliens and 1500 British subjects resident in the neighbouring Spanish town of La Linea, who come into Gibraltar daily. The number of births during the year 1924 was 360, being at the rate of 22·25 per 1000, among the fixed population only; under the Aliens Order in Council no alien may give birth in the colony; 254 deaths were registered, and the crude death-rate was 14·66 per 1000. Infantile mortality was 91·6 per 1000, and deaths from pulmonary tuberculosis 1·5 per 1000. The number of deaths from cancer was 27, an increase of nine over the previous year. The general health during the year was very satisfactory. There was no disease in epidemic form. The climate of Gibraltar is in general mild and temperate, though somewhat hot and oppressive during the months of July and August. The meteorological record for 1924 showed 70·88° F. as the mean maximum temperature, the highest shade temperature being 91° on July 17th and August 19th, and the lowest, 38°, on Feb. 28th. The rainy season spreads over the period from September to May; the annual average rainfall is 35 inches, but in 1924 44 inches were registered, of which 15·17 inches fell in February.

PUBLIC HEALTH IN WEST INDIAN ISLANDS.

Cayman Islands.

These three small islands in the Caribbean Sea are situate north-west of Jamaica (of which colony they are a dependency), and approximately midway between that island and the south-west of Cuba. Mr. H. H. Hutchings, the Commissioner, in his report for 1924, gives the estimated population as 5365. There were 139 births (26 per 1000) and only 55 deaths (10 per 1000). The general health is good. The staple food of the people consists of cassava, yams, sweet potatoes, and bread fruit, all locally grown, and the ordinary wheat and corn products by way of imports. These constitute an almost entirely starchy diet which induces mild digestive disorders. There were no epidemics in 1924. Of the 55 deaths, 16 were returned as infants, two under 20 years, and 31 between 50 and 103, 27 being persons over 70 years of age. There were three deaths from pulmonary tuberculosis and two from cancer, all persons in early life.

Grenada.

The estimated population at the end of 1924 was 68,957, its density being 518·47 per square mile. The birth-rate for the year was 31·86, and the death-rate 16·8 per 1000, the latter comparing very favourably with that in other West Indian Colonies. The death-rate per 100 births of infants dying under 1 year was 11·10. Through the efforts of Lady James, an infant welfare centre was established towards the end of the year, and a creche has now been opened. The principal causes of death during the year were: diarrhœa and enteritis, 296; malaria, 108; enteric fever, 22; dysentery, 34; pulmonary tuberculosis, 52; and syphilis, 16. Grenada, in the extreme south of the Caribbean Sea, is the nearest British island to the mainland of South America, with the exception of Trinidad and Tobago. Its area is about 120 miles, but including Carriacou, an island to the north, 133 square miles. The country is mountainous and well watered by streams. St. George's Harbour, landlocked and deep-watered, is one of the most beautiful in the West Indies. The mountain spurs, clothed with forests to their summits, intersect the island into numerous picturesque valleys. There are two small lakes, formed in extinct craters, one called the Grand Etang, being situated near the centre of the island, 1740 feet above sea-level, while the other, Lake Antoine, is near the sea on the eastern coast. A sanatorium is established near the former. The climate can be classed as excellent, and from December to May is delightful. The trade winds are steadily prevalent during this period, but occasionally fail in the autumn months which are somewhat damp and hot. The range of temperature is small and tends to make the climate equable and healthy. The thermometer seldom reaches 90° F. in the shade or drops below 70°, and these occasions occur so rarely that they are specially recorded. The rainfall in the lowlands of the south is as low as 30 inches; in the mountainous centre it approaches 140 inches. At St. George's, midway between the two, the rainfall in 1924 was 81·51 inches, as compared with an average over 30 years of 74·83 inches.

St. Vincent.

The general health of the island throughout the year 1924 was (states Mr. R. Walter, the administrator, in his annual report) good. The total population at Dec. 31st was 47,591. The birth-rate for the year was 37·72 per 1000, and the death-rate 16·49. The latter showed a considerable decrease as compared with 1923 when it was 22·1. Thirty cases of enteric occurred with ten deaths. Infantile mortality showed a considerable decrease, deaths of children under 1 year (excluding still-births) numbering 169 as against 237 in 1923, and the mortality-rate per 1000 births 99 as against 128. It is noteworthy that illegitimate births amounted to over 75 per cent. of all the births, and that out of 93 still-births 79 were illegitimate. The campaign against yaws was continued with success, a total of 2377 cases being treated, of which 1813 were cured. A residence was built for the district medical officer residing at Chateaubelair—a long-felt need—and various sanitary improvements were effected in the smaller towns, but the colony is still in need of a qualified chief sanitary officer to train and supervise the work of the sanitary inspectors. St. Vincent is one of the healthiest of all the West Indian islands. The climate may be divided into two seasons, wet and dry—the dry season from January to May, and the wet season from June to December. The coolest months are December to

April. The temperature throughout 1924 varied from 78·1 to 81·8° F. The mean monthly temperature was 80·2°. The rainfall at the Agricultural Experimental Station in Kingstown, 80 feet above sea-level, was 85·07 inches. Rain fell on 277 days, and the greatest fall for one day was 3·63 inches on July 29th.

FINANCE OF VOLUNTARY HOSPITALS.

Mr. L. G. Brock, Principal Assistant Secretary of the Ministry of Health, addressing the Manchester Statistical Society on Voluntary Hospital Statistics, said that in Manchester the hospital statistics were more complete than in any other city outside of London. The report of the local voluntary hospitals committee was a model of its kind. Hospital statistics must supply answers to three vitally important questions: (1) Is the public doing its duty to the hospitals? (2) Are the hospitals solvent, judged by ordinary business standards? (3) If they are not solvent, in what directions can expenditure be reduced or income increased?

In 1924 more than 200,000 patients were treated at Manchester hospitals, but in spite of this at the end of the year upwards of 3400 persons were awaiting admission as in-patients. In general, the answer to the first question was satisfactory. The public was doing its duty to the hospitals. As regards income and expenditure, taking the voluntary hospitals of England and Wales, in 1922 there was a deficit of £203,000; in 1923 a surplus of £497,000; and in 1924 a surplus of £177,000. Industrial depression did not provide a sufficient explanation of recurring deficits. Sheffield, which had suffered from trade depression acutely, had steadily increased the income of its hospitals. Manchester was one of the black spots. The deficits on the ordinary income of the three years, 1922–23–24, were respectively £49,424, £39,278, and £48,672. In the Manchester hospitals in 1924 the percentage of the total ordinary income derived from endowments was 21·3; from patients' payments and public authorities, 32·3; and from voluntary gifts, 46·4. In Manchester the cost per bed in the various hospitals compared very favourably with the costs of similar hospitals elsewhere. It was doubtful if special whirlwind campaigns to reduce debts were really a sound method of raising revenue. They were almost always followed by a period of reaction. A steady increase of income was much more valuable than an occasional boom year. The total subscriptions to the Manchester hospitals in 1922 amounted to £55,469, and in 1924 to £61,026. If the hospitals were to retain the support of the middle classes, they must do something for them.

There was much to be said for paying wards, not as a means of raising revenue but as a means of maintaining interest in the voluntary system. If any unified appeal for new subscriptions was to be made in Manchester, it would be powerfully reinforced if some part of the proceeds could be marked for the provision of accommodation for middle-class patients, either on the lines of the Forbes Fraser scheme at Bath, or on the lines of St. Chad's Hospital at Birmingham. A most important possible source of increased revenue was workmen's contributions. The most hopeful method of developing this source of income was to establish some kind of mass contribution scheme. In urban areas probably the best known was the Sheffield scheme. At Sheffield, said Mr. Brock, the workers undertake to contribute a penny per pound a week of their wages, and the employers add 25 per cent. of the employees' contributions. In 1921 the contributions from workmen was £7,840, and from employers £2,500, and the estimated corresponding amounts in 1925 were £104,000 and £28,000. It is said that in the majority of cases the cost of collection did not exceed 3 per cent. of the gross amount collected.

THE CLIMATES OF THE UNITED STATES.

CLIMATE may influence health in two ways: first, it may affect more or less directly the life, development, and virulence of the micro-organisms which are the specific cause of disease; and secondly, it may strengthen or weaken the individual's power of resistance against the attacks of these organisms. It must be remembered that a change of climate usually involves a change of residence, habits, occupation, and food; these are often of as great significance as the change of climate itself. Indeed, this has been recognised since the time of Hippocrates who wrote, "in chronic diseases it is advisable to go to another country."

Not since 1857, when Lorin Blodget's "Climatology of the United States" was published, has any attempt been made to give a concise and systematic account of the climates of the United States. Prof. Ward, of Harvard University, who has studied the subject for 25 years, has now given us a handy and readable volume,[1] well illustrated with graphs and maps, suitable for the purposes of teachers and students of climatology. The book also supplies such information as may be required by medical men, foresters, agriculturists, and the general public. The chapter headed Climate and Health gives a brief and unbiased synopsis of the general medical aspect of the climates of the United States. The States are fortunate in having a fair variety of climates, so that during the cold winters of the northern States one may travel south—for instance, in the eastern province to Florida. Again, during the heat of summer, one may travel to a cooler resort in the north. The western mountain and plateau region is of special interest in that it embraces the districts of Colorado which have become famous for the altitude treatment of pulmonary tuberculosis. The Pacific slope, with its great latitudinal extensions, includes a great variety of climates. It is, however, the southern coast of California which is its best known health resort, winter and spring being the favourite seasons.

The author deals only briefly with local differences between health resorts. The main part of the book deals chiefly with ordinary questions of meteorology such as temperature, frost, winds, rainfall, snowfall, humidity, sunshine, clouds, fog, thunderstorms, tornadoes, blizzards, and heat waves. There are also special chapters on Climate and Crops and the Climates of Alaska. Amongst the phenomena of more general interest discussed are heat waves, tornadoes, the Indian summer, and the Chinook wind. Spells of excessively hot weather, occurring at irregular intervals and lasting for various periods of time, are characteristic of the summers of the central and eastern United States, especially of the great Mississippi lowland, of the Ohio valley regions, and eastward to the immediate Atlantic coast. In connexion with these heat waves heat prostration and sunstroke are common. The numbers of deaths, especially those of infants and young children from cholera infantum, may become appallingly large. Dr. W. F. R. Phillips found that during the three weeks ending August 22nd, 1896, there were 2036 known deaths directly due to sunstroke, and the list was doubtless far from complete. Probably more than 12,000 cases of varying degrees of severity actually occurred.

The tornado is stated to be the most violent atmospheric phenomenon with which man has to contend. Its wind velocities are greater than those of the dreaded tropical cyclone. Its strength is superior to that of any structure which may be built to withstand it. In its fullest development it is peculiarly and characteristically American. It finds its real home in the great central lowlands of the eastern portion of the United States. Nowhere else in the world do tornadoes find equal opportunities for development. They resemble the great summer thunderstorms of the eastern United States in being typically American. They cause great damage and loss of life. The Indian summer is a more pleasing phenomenon. It comes in October or early in November after the equinoctial storms. It is usually described in poetic terms; the calm sunny days; the dry, mild, and genial atmosphere; the smoky haze which lends to the distant view a soft, indistinct, impressionistic tone and paints the sunset a glorious but subdued red; the wonderful colouring of the autumnal foliage; the welcome return, for a short space, of summer warmth following the first frosty nights and cool days of advancing winter. The Chinook wind is a characteristic feature of the eastern slope of the Rocky Mountains in Montana and Wyoming and as far south as Colorado. It is also noted elsewhere. It is a warm and dry wind, similar in all respects to the Swiss "foehn." It begins at any hour, day or night. In velocity it varies from a gentle breeze to a gale. It may blow steadily for hours or for three or four days. Extraordinary stories are told regarding the warmth of the Chinook, and we may well imagine what a welcome it receives when the preceding temperature has been 20° to 30° below zero. It is described as soft and balmy "like a summer zephyr."

INSULIN ON THE DISTRICT.

THE work of the Cicely Northcote Trust has already been reviewed in our columns.[1] The Trust works in connexion with St. Thomas's Hospital, London, and in its sixteenth annual report, issued by the hon. secretary at 15, Chesham-street, Belgrave-square, S.W., an interesting account is given of the valuable after-care offered to diabetic patients requiring insulin. The subject of self-injection of insulin and its dangers has already been briefly discussed,[2] but the proper administration of the drug is far from being the only problem in the after-care of diabetics. These patients have to be supervised for an unlimited period; not only must they have a continuous supply of insulin, but sufficient income to obtain the necessary diet. Under the Trust's management the procedure is as follows: As early as possible

[1] The Climates of the United States. By Robert De Courcy Ward, Professor of Climatology in Harvard University. Boston: Ginn and Company. 1925. Pp. 518. $4.00.

[1] THE LANCET, 1925, i., 828.
[2] THE LANCET, 1925, ii., 765 and 893.

the ward sister notifies the Northcote Trust worker of the probable date of discharge, and the dose the patient is needing, supplying when necessary a copy of the diet sheet. Very often special diabetic bread and biscuits and sufficient insulin for the patient to use for a week or two are given, together with a syringe, as no risks can be taken. But much planning hereafter is necessary to see that the supply is continuous. Even the need for accurate scales must be considered, and these have sometimes to be lent as they do not always form part of the household's equipment. Although the patients are instructed in the wards how to give their own injections, only in rare cases is it considered safe for this to be continued without supervision, and the services of the district nurses are enlisted to witness the injections. These injections are given twice daily, at 9 A.M. and 6 P.M., and as the patients may not have a meal until after they have had their insulin, these times have to be adhered to as rigidly as possible. This is sometimes no easy matter for the hard-worked nurse in a scattered country district.

The invariable recommendation for diabetic patients is that they "must have no cause to worry." Sometimes this means a complete change of environment—perhaps a visit to the country or sea—with the necessary proviso that insulin and diet shall be provided. The economic consideration needed may be illustrated by giving two fairly typical cases.

CASE 1.—The patient required a special expensive diet and insulin. She needed a room to live in, a fire and gas or oil to cook by. The budget for these simple necessaries worked out as follows: Insulin, 6*s.*; room, rent, and storage of furniture, 11*s.*; diet, as inexpensively worked as possible, 25*s.*; fuel, oil, 3*s.* This gave a total of £2 5*s.*, which left no margin for clothes, soap, and the hundred-and-one tiny things which are scarcely counted in the budgets of those who have no financial worries. At the time of the recommendation the patient's assured income was £1 10*s.* weekly. She was uninsured and therefore could not obtain the insulin through a panel doctor, and the guardians were unable to help because her income was over scale. Had the diet been no problem, the patient could have existed without undue worry; but with the expense of a special diet this became impossible.

CASE 2.—B, aged 12. Father, labourer in country district, two sisters in service, four other brothers and sisters at school. The family shares a cottage of three rooms and there are seven mouths to feed. B returned from hospital on a large dose of insulin and an expensive diet. He is a difficult little boy to feed in any case. The mother has not only to provide the diet, but to persuade him to take the correct quantity of the correct food at the correct time. This task was cheerfully faced by his busy mother, but the question of the provision of sufficient butter, eggs, cream, and bacon was a difficult one as it could not be met out of the family budget.

It is in such cases as these that the work of the Cicely Northcote Trust and similar bodies is invaluable and irreplaceable. Such workers require cordial support and assistance.

PECULIAR PAIN IN APPENDICITIS.

To the Editor of THE LANCET.

SIR,—The following cases were recently under my care.

CASE 1.—Male, aged 55. No previous history of ill-health. When called to see him at 3 A.M. he complained of vomiting and a "pain in his stomach." His bowels had moved some hours previously. Pulse 70, temp. 98·2° F. Hernial orifices normal. He was lying on his back with both legs slightly flexed. His abdomen was slightly distended. There was no rigidity or tenderness, but on deep pressure over McBurney's point he complained of great pain. No swelling or tumour of any sort could be detected, and rectal examination revealed nothing abnormal. On percussion a tympanitic note was obtained all over the abdomen. On rotating the extended right leg internally (Cope's sign) there was no increase of the pain, but on internally rotating the extended left leg he complained of pain around the umbilicus. I gave him ⅓ gr. of morphia by mouth and called to see him six hours later, when the vomiting had stopped, but the paroxysms of pain in the appendix region continued, but in a milder form. He still complained of pain around the umbilicus on internally rotating the left leg. A soap and turpentine enema gave good results. He was kept in bed for a week on a light diet, with one tablespoonful of liquid paraffin twice daily. Under this treatment the pain almost ceased and his bowels moved daily. Two weeks later he was perfectly well.

CASE 2.—Boy, aged 12. Previously healthy. When called at 10 A.M. he was lying in bed in the typical appendix attitude. He complained of pain in his right side and had vomited several times. Temp. and pulse were normal. His bowels had moved the previous day. On examination the only abnormality that could be made out was pain on deep pressure over McBurney's point. He also complained of pain around the umbilicus on internally rotating his left leg. He was given a glycerine suppository, and hot poultices were applied to the right side of his abdomen. At 4 P.M. the pain was less, the vomiting had stopped, but his temperature was 99·4° F. and his pulse was 100, but the pain on internally rotating the left leg persisted. The parents refusing their consent to an operation, the boy was kept in bed for a week on a light diet, with liquid paraffin when necessary. At the end of this time he was quite recovered.

Can any of your readers tell me if these were cases of true appendicitis, or of what used to be called perityphlitis? What is the explanation of pain around the umbilicus on rotating the left leg internally? I can find no reference to this sign in the literature.

I am, Sir, yours faithfully,

Dublin, Jan. 18th, 1926. SYLVIA B. WIGODER, M.D.

INOCULATION FOR SMALL-POX.

To the Editor of THE LANCET.

SIR,—Dr. John Macqueen does not point out in his article (THE LANCET, Jan. 23rd, p. 212) that, although Lady Mary Wortley Montagu may have made fashionable in England after 1717 the practice of inoculation, others can lay claim to priority of description in this country. Weld, in his "History of the Royal Society" (1848), details the whole affair and draws attention to two early papers in the *Philosophical Transactions*. The first paper was published in 1714: An Account, or History, of the Procuring the Small Pox by Incision or Inoculation, being the Extract of a Letter from Emanuel Timonius, Oxon., & Batav, M.D., S.R.S., dated at Constantinople, December, 1713 (*Phil. Trans.*, xxix., April, May, June, 1714, pp. 72–82). The second paper is entitled: Nova et tuta Variolas excitandi per Transplantationem Methodus, nuper inventa & in usum tracta. Per Jacobum Pylarinum, Venetum, M.D. & Reipublicæ Venetae apud Smyrnenses nuper Consulem (*Phil. Trans.*, xxix., January, February, March, 1716, pp. 393–399). It was not until June, 1716, that Lady Mary's husband was appointed ambassador to the Porte, and in a letter to England, dated April 1st, 1717, she described the practice of inoculation as she had seen it at Adrianople.

I am, Sir, yours faithfully,

E. G. T. LIDDELL.

Trinity College, Oxford, Jan. 25th, 1926.

OLD AGE MUST COME. . . .

MUCH has been written and said of the increased expectation of life enjoyed by the child born to-day as compared with 50 or 100 years ago. Life insurance tables have been readjusted and public health activity has been credited with the extra 10 years or more to which our grandchildren may look forward with some certainty. There is, however, another side to the picture, and it is not only the cynics who have declaimed against this attempt to postpone the inevitable end. The idea of an extra 10 years of enforced idleness after a busy and interesting life does not appeal to everyone, even if hobbies and other pleasant occupations can still be enjoyed, and on reading a booklet by a life insurance company dealing with the period of old age, the thought may arise that while insurance firms may have a certain interest in keeping us alive, there is something to be envied in those fortunate individuals who meet the "old man's friend," pneumonia. The primary object of Dr. Leonard Williams's latest pamphlet "The Sere and Yellow Leaf," issued by the Legal and General Assurance Society, Ltd., is to inculcate the idea of periodical health examinations, which commends itself to all health workers and is fully in keeping with the modern slogan of prevention. With his recommendation to the elderly man of walking and other exercises, and with his emphasis on cultivating outside interests, all sane people will be in agreement. Less convincing is the impression conveyed by Dr. Williams's remarks that comfort in old age is to be eschewed. "It is the fur-lined basket by the cosy fireside which is the real enemy of man," he writes. But is not this the just reward of the professional octogenarian? And if "therein lies the secret of the sere; therein lurks the canker of the yellow leaf," the restful autumn scene on the cover of the booklet should reassure any such who is beginning to feel uncomfortable in his fireside seat. Obviously a healthy old age will be more enjoyable than one troubled by sickness and disease which might have been prevented if discovered in time at a periodical medical examination, and this sentence contains all that the booklet intends to convey.

HOSPITAL AREAS IN EAST KENT.—A conference at Canterbury of representatives of the East Kent hospitals has decided to appoint a joint committee for the delimitation of areas and the collection of money, and to consider arrangements for reciprocity of treatment.